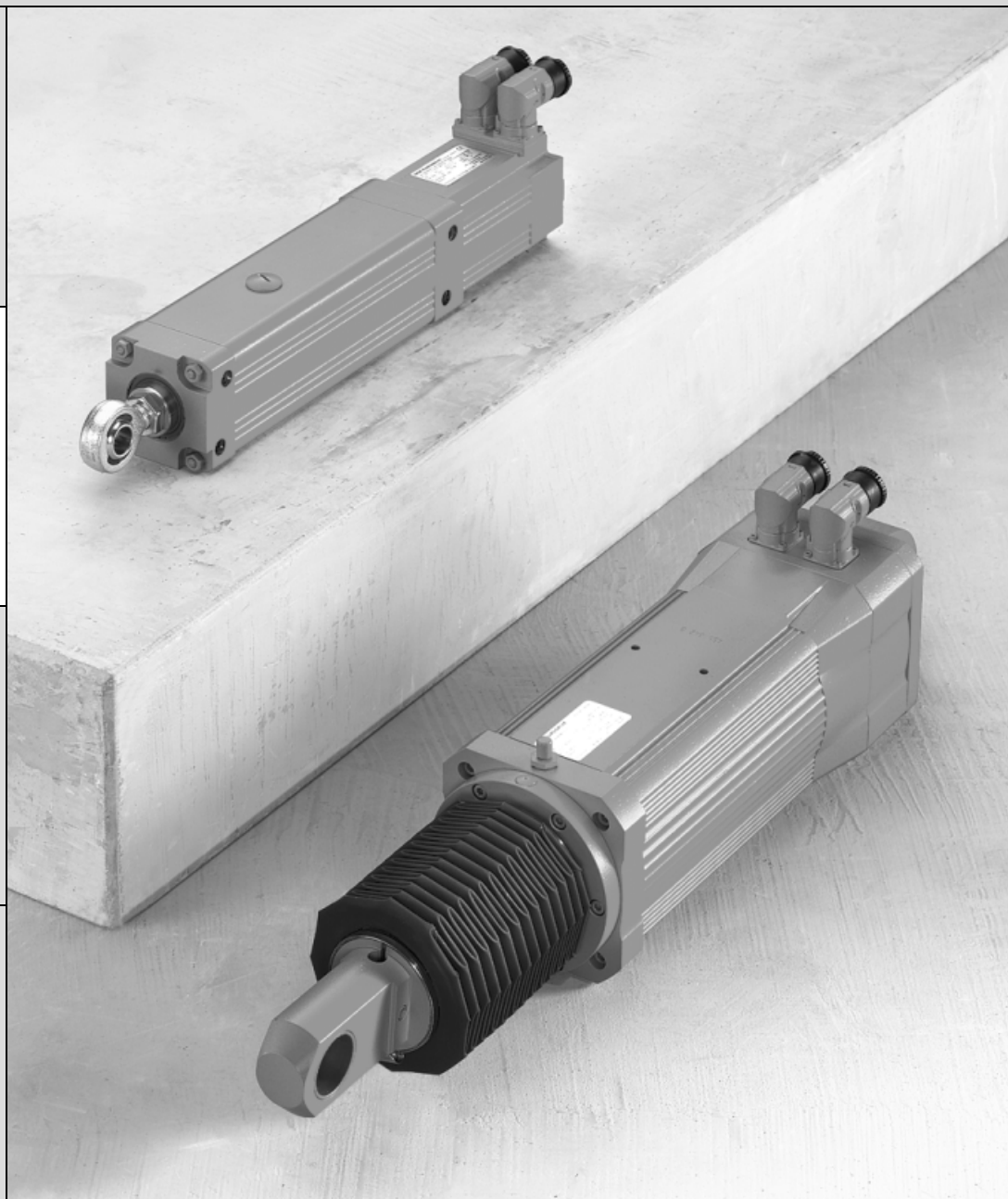
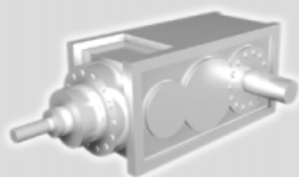
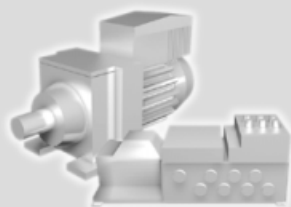
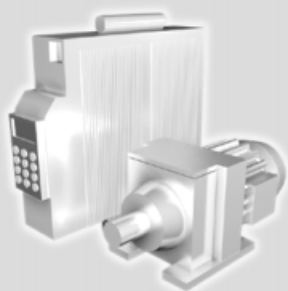




SEW
EURODRIVE



CMS Electric Cylinders

Edition 05/2007

11562617 / EN

Operating Instructions





1 Important Notes	4
1.1 Important notes and designated use	4
1.2 Explanation of symbols	5
2 Safety Notes	6
3 Motor Design	8
3.1 Design versions	8
3.2 Operating principle	9
3.3 Basic design of the CMS electric cylinder	10
3.4 Unit designation	12
3.5 Nameplate	13
3.6 Mechanical and electrical characteristics	14
3.7 Operating principle of the recirculating ball screw and planetary roller screw drive	17
3.8 Sealing air	18
4 Mechanical Installation	19
4.1 Before you begin	19
4.2 Preliminary work	19
4.3 Installing the electric cylinder	20
4.4 Mounting dimensions for CMS50S	21
4.5 Mounting dimensions for CMS71L	24
4.6 Installation on site, customer-provided	26
5 Electrical Installation	34
5.1 Connector installation	34
5.2 Wiring notes	36
5.3 Connecting electric cylinders and encoder systems using SM.. / SB.. plug connectors	37
5.4 Power cable	38
5.5 Feedback cable	43
5.6 Mating connector combinations	49
5.7 Cable specification	50
5.8 Assembling resolver/HIPERFACE® plug connectors	59
5.9 Assembling the power connector	62
5.10 Brake	65
5.11 Motor protection	66
6 Startup	68
6.1 Prerequisites for startup	68
7 Malfunctions	69
7.1 Motor malfunctions	69
7.2 Malfunctions when operating with a servo inverter	70
7.3 Brake malfunctions	70
7.4 Customer service	70
8 Inspection and Maintenance	71
8.1 General maintenance work	71
8.2 Lubricating threaded spindles	71
8.3 Lubricant for recirculating ball screws and planetary roller screws	73
8.4 Lubrication interval	73
8.5 Lubricator – only for size CMS71	75
8.6 Assembly and startup of the Star Vario / Star Control lubricator	77
9 Technical Data	82
9.1 Technical data of the CMS50S electric cylinder	82
9.2 Technical data of the CMS71L electric cylinder	83
9.3 Technical data of the CMS71M electric cylinder	84
9.4 Brake	84
10 Declaration of Conformity	85
11 Index	86



Important Notes

Important notes and designated use

1 Important Notes

1.1 *Important notes and designated use*

1.1.1 Integral part of the product

The operating instructions are an integral part of the CMS electric cylinder and contain important information for operation and service. The operating instructions are written for assembly, installation, startup and service employees who are involved in the installation and maintenance of CMS electric cylinders.

1.1.2 Designated use



The designated use refers to the procedure specified in the operating instructions.

Series CMS electric cylinders are units run by motors for industrial and commercial systems. If motors are subject to loads other than those permitted, or if they are used areas of application other than industrial and commercial systems, you must first consult with SEW-EURODRIVE.

Do not start up the unit until you have established that the machine complies with the EMC Directive 89/336/EEC and that the conformity of the end product has been determined in accordance with the Machinery Directive 89/392/EEC (with reference to EN 60204).

1.1.3 Qualified staff

CMS electric cylinders represent a potential hazard for persons and material. Consequently, assembly, installation, startup and service work may only be performed by trained staff who are aware of the potential hazards.

Staff must be appropriately qualified for the task in hand and be familiar with the assembly, installation, startup and operation of the product. Staff must read the operating instructions, in particular the safety notes section, carefully and ensure that they understand and comply with them.

1.1.4 Liability for defects

Incorrect handling or any action performed that is not specified in these operating instructions could impair the properties of the product. In this case, you lose any right to claim under warranty against SEW-EURODRIVE GmbH & Co KG.

1.1.5 Product names and trademarks

The brands and product names contained in these operating instructions are trademarks or registered trademarks of the titleholders.

1.1.6 Disposal



This product includes parts made of:

- Iron
- Aluminum
- Copper
- Plastic
- Electronic components

Dispose of all components in accordance with applicable regulations.



1.2 Explanation of symbols

Always comply with the safety and warning instructions in this publication.



Electrical hazard

Possible consequences: Severe or fatal injuries.



Hazard

Possible consequences: Severe or fatal injuries.



Hazardous situation

Possible consequences: Slight or minor injuries.



Harmful situation

Possible consequences: Damage to the drive and the environment.



Tips and useful information.



2 Safety Notes

Safety functions



Series CMS electric cylinders may not execute any safety functions without master safety systems.

Use master safety systems to ensure that equipment and personnel are protected.

General notes

- Read the safety notes carefully. Also consider the supplementary safety notes in the individual sections of these operating instructions.
- Check the delivery for transport damage. If damage is found, inform your supplier immediately.
- Consult the operating instructions that are included in the delivery.
- The CMS electric cylinder fulfills the requirements of article 4 of the EMC directive 89/336/EEC.
- SEW-EURODRIVE is not liable for modifications, changes, additions and / or alterations to the product.
- Use only spare parts and accessories manufactured according to the specifications of SEW-EURODRIVE.
- Read the installation and operating instructions completely and carefully prior to installation, use or repair of the CMS electric cylinder.
- All work related to transport, storage, setting up/mounting, connection, startup, maintenance and repair is to be carried out by trained staff only.
- Note the system-specific guidelines and requirements.
- Never disassemble or disable any safety devices.
- If you notice unusual behavior of the electric cylinder during operation, such as increased operating temperatures or unusual motor noise, shut down the electric cylinder immediately.
- Work on the electric cylinder only when it is not in use. Secure the electric cylinder against unintended power-up.

Operating environment



The following uses are prohibited unless the unit is expressly designed for the purpose or conditions specified:

- Use in potentially explosive areas.
- Use in environments including harmful substances such as oils, acids, gases, vapors, dust, radiation, etc.; consult SEW-EURODRIVE.
- Use in non-stationary applications that are subject to mechanical vibration and impact loads in excess of the requirement of EN 50178.

**Transport /
storage**

Immediately upon receipt, inspect the shipment for any damage that may have occurred during transportation. Inform the shipping company immediately. It may be necessary to preclude startup.

Use suitable, sufficiently rated handling equipment if necessary. Remove any transportation restraints prior to startup.

Operating notes**Burns hazard**

Touching the CMS electric cylinder when it has not been cooled can result in burns. The CMS electric cylinder can have a surface temperature of over 65 °C (149 °F).

To prevent burns:

- Never touch the CMS electric cylinder during operation or during the cool-down phase once it has been switched off.



In hoist applications, note that the load torque of the application to be held in place must be less than the holding torque of the brake used. Observe the project planning guidelines. The spindles that are used are not self-locking.

**Crushing hazard**

Incorrect use, installation or operation represents a crushing hazard due to the vertical movement of the spindle.

**Mechanical
installation**

Follow the instructions in the "Mechanical Installation" section.

**Inspection /
maintenance**

Follow the instructions in the "Inspection / Maintenance" section.

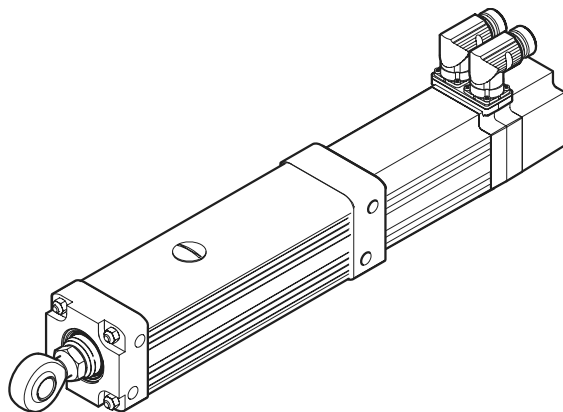


3 Motor Design

3.1 Design versions

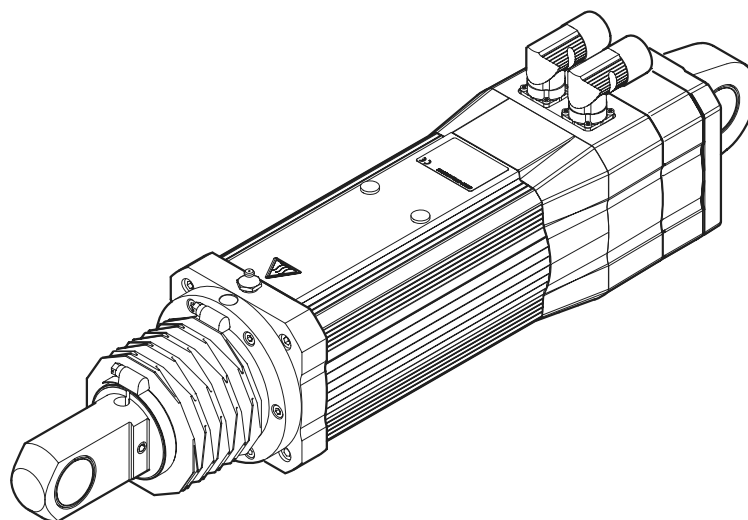
SEW-EURODRIVE offers **two product versions** for electric cylinders:

3.1.1 CMS50S



61946AXX

3.1.2 CMS71L/M



61947AAXX



3.2 Operating principle

3.2.1 General

Synchronous servomotors of the SEW CM motor series are used as the basis for the CMS electric cylinder series.

The service life of the electric cylinders (threaded spindle and bearings) must be taken into account, as it depends on the load cycle and travel cycle. The electric cylinders are equipped with a resolver that serves as a speed and position encoder. The absolute encoder (HIPERFACE® encoder) is available as an option. In connection with a servo controller, you can freely define acceleration, velocity, position and force profiles.

The repeat accuracy is 5/100 mm (0.002 in), if force and temperature are constant. The electric cylinders are available with or without brakes (holding brake only). The motor is available with plug connector only (no terminal box). The SM and SB plug connector type of the DS56 and CMP motor series are used as plug connectors (for resolver, HIPERFACE® encoder and power).

3.2.2 CMS50S

A CMP50S servomotor is used for the drive. An add-on component, comprising a threaded spindle and guide, is flanged onto the unit. All components and options of the motor, except the flanged end shield and the rotor (due to the larger bearing), are used by the CMP.

As standard, the drive is adapted to the customer's application through the flanged end shield on the drive side of the motor. The rotor turns the threaded spindle while the nut remains fixed. The nut is routed in an aluminum extruded housing via T-slot nuts.

The nut and piston rod are connected to each other. The piston rod has a high-quality, smooth, corrosion-resistant surface and is sealed. The joint head is connected to the piston rod. The spindle nut has a lubricant reservoir, which extends the relubrication interval. Relubrication can also be carried out by an internal greasing nipple.

3.2.3 CMS71L/M

Synchronous servomotors of the SEW CM motor series are used as the basis for the CMS71L/M electric cylinder series.

The rotors are designed as a hollow shaft. The spindle nut of a recirculating ball screw or planetary roller screw drive is attached to the rotor. Depending on the direction of the motor rotation, the threaded spindle is moved out of or in to the rotor. The threaded spindle must be prevented from turning, so that the rotary motion of the rotor (spindle nut) is transformed into a linear motion. The threaded spindle is protected from "heavy" contamination by a bellows.

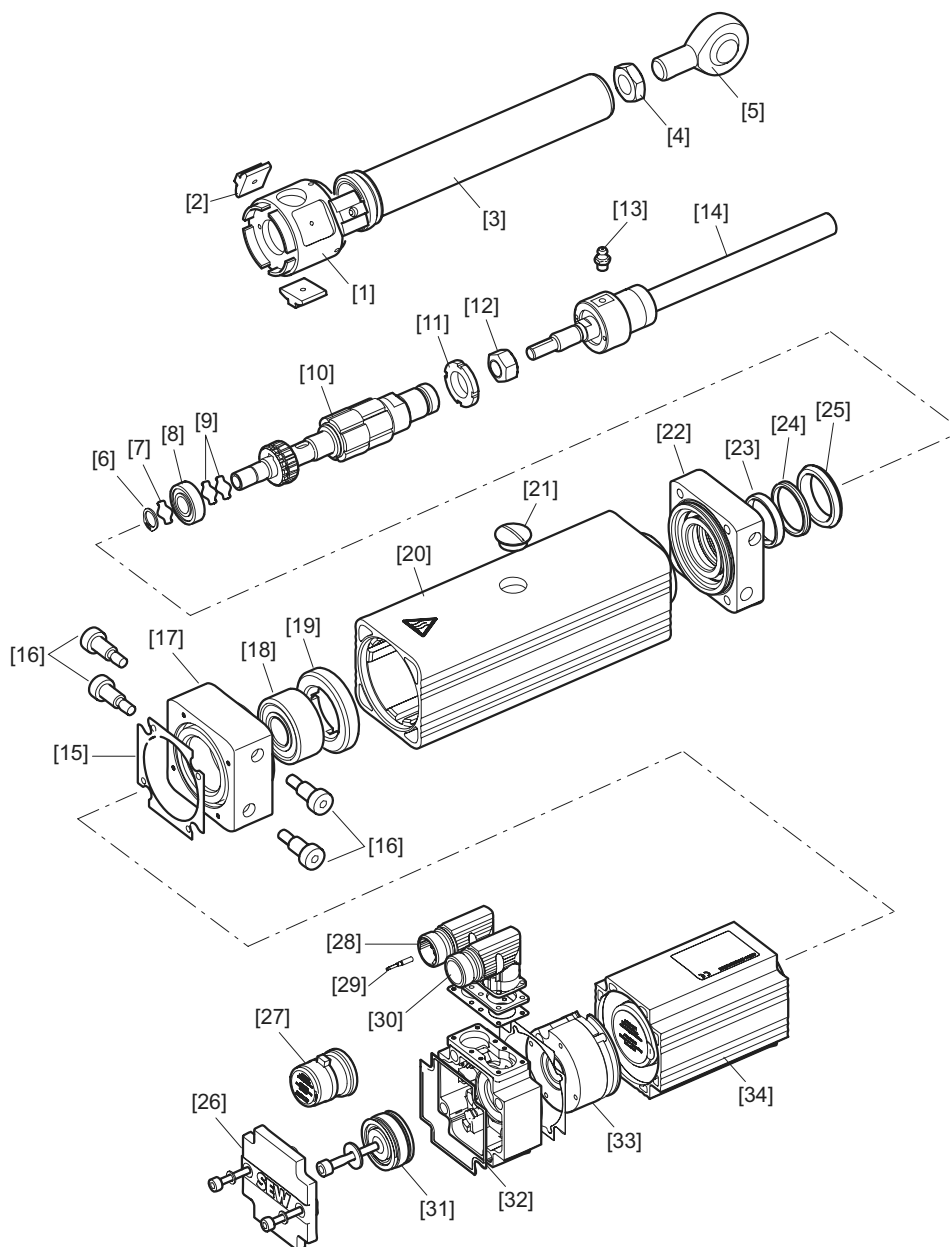


3.3 Basic design of the CMS electric cylinder

3.3.1 CMS50S



The following illustration is intended to explain the general structure of the unit. It serves as an assignment aid to the spare parts list. Motor size and version may cause differences.



61798AXX

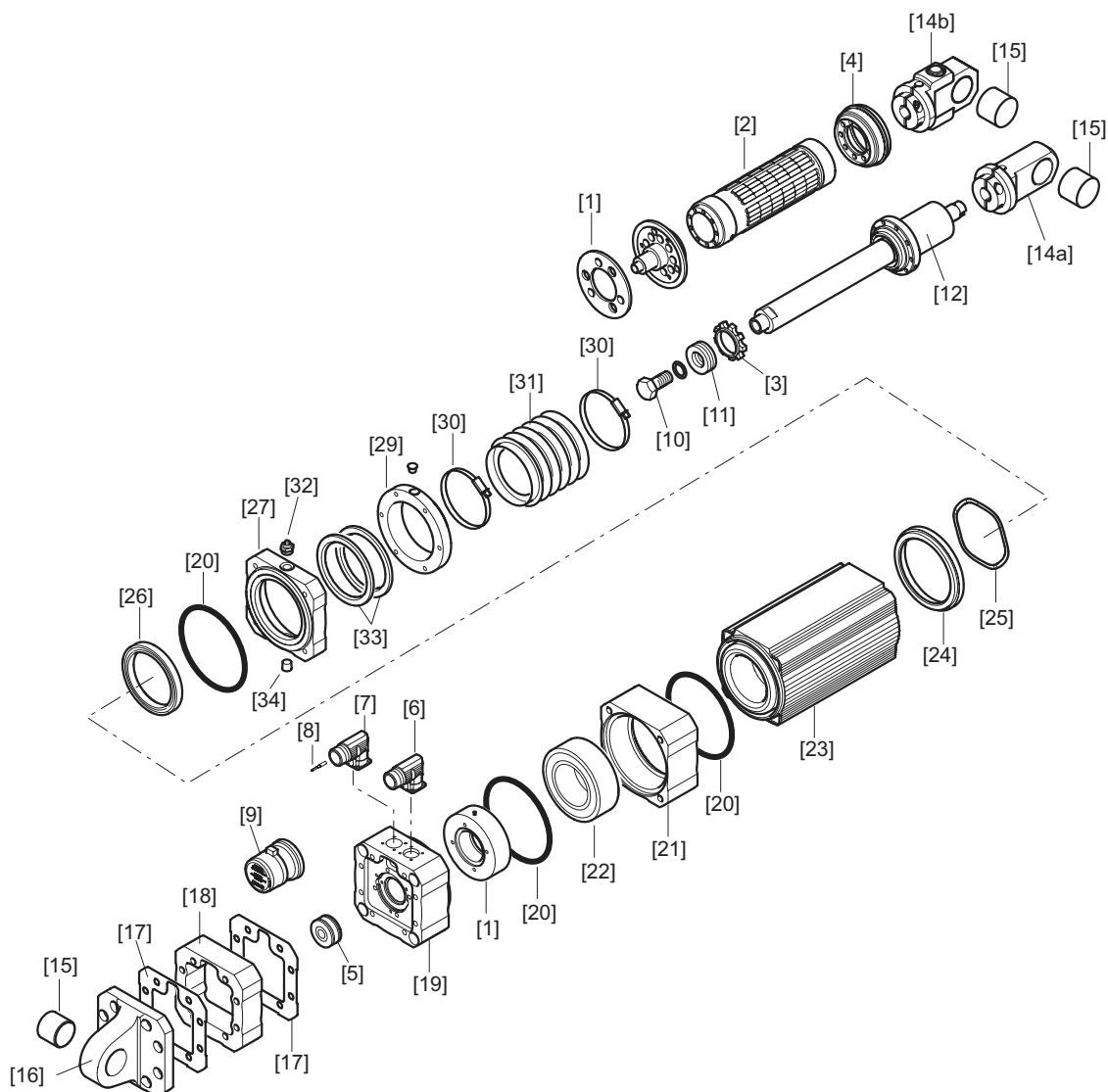
[1] Torque arm	[10] Rotor with magnet	[19] Ring nut	[28] Power plug connector
[2] T-slot nuts	[11] Slotted nut	[20] Built-on housing	[29] Pin contact
[3] Piston rod	[12] Hex nut	[21] Screw plug	[30] Signal plug connector
[4] Hex nut	[13] Greasing nipple	[22] Cover disc	[31] Resolver
[6] Shim washer	[14] Threaded spindle	[23] Guide ring	[32] Flat gasket
[7] Shim washer	[15] Flat gasket	[24] Drive-side (A-side) gaskets	[33] Brake
[8] Deep groove ball bearing	[16] Fit bolts	[25] Wiper ring	[34] Stator housing
[9] Shim washer	[17] B-side endshield	[26] B-side cover	
	[18] Angular contact ball bearing	[27] Absolute encoder	



3.3.2 Size CMS71L/M



The following illustration is intended to explain the general structure of the unit. It serves as an assignment aid to the spare parts list. Motor size and version may cause differences.



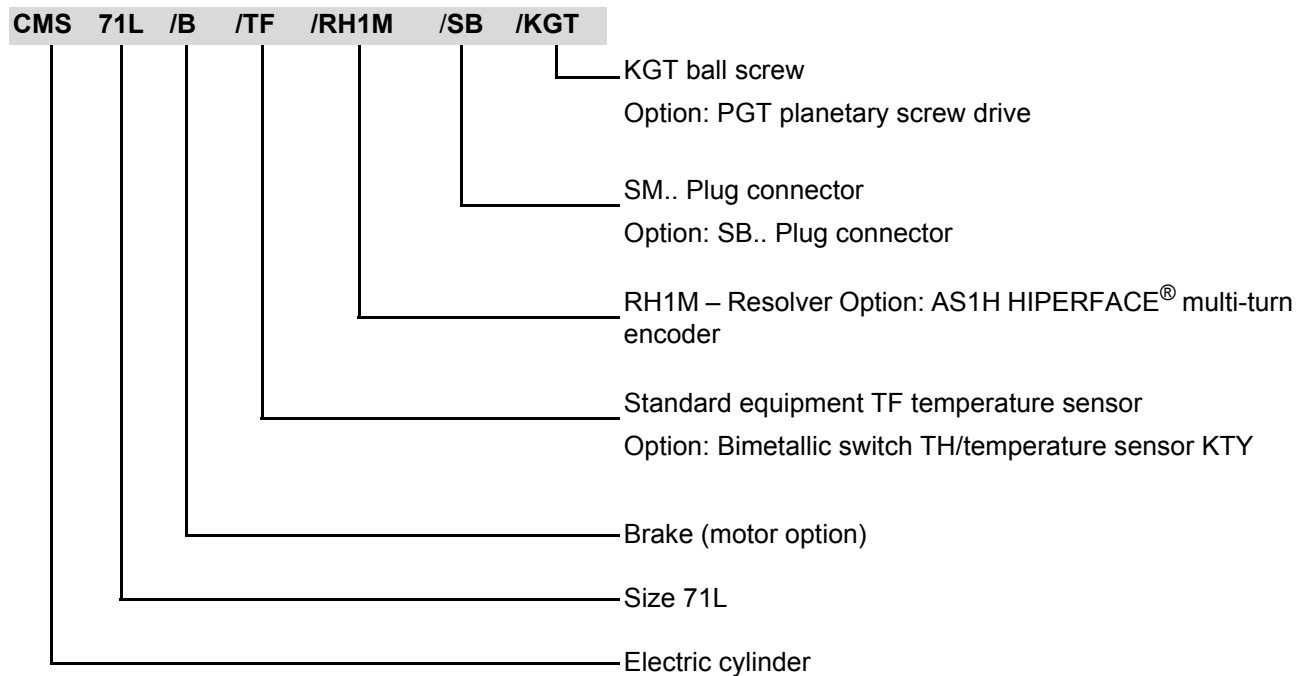
61783AXX

- | | | | |
|---------------------------|------------------------------------|-----------------------------------|----------------------|
| [1] Brake | [10] Hex head bolt | [19] Encoder housing | [29] Disc |
| [2] Rotor with magnet | [11] Disc spring package | [20] O-ring | [30] Hose clamp |
| [3] Stop | [12] Threaded spindle | [21] B-side endshield | [31] Bellows |
| [4] Adapter flange | [14a] Joint head, rigid (standard) | [22] Angular contact ball bearing | [32] Greasing nipple |
| [5] Resolver | [14b] Joint head cardan joint | [23] Complete stator | [33] 2 oil seals |
| [6] Signal plug connector | [15] Socket | [24] Clamping ring | |
| [7] Power plug connector | [16] B-side cover | [25] Shim washer | |
| [8] Pin contact | [17] Flat gasket | [26] Deep groove ball bearing | |
| [9] Absolute encoder | [18] Spacer | [27] Cover disc | |



3.4 Unit designation

Example: CMS71L electric cylinder



Designations for additional options for CMS71L:

KG = Cardan joint

SV = Vario lubrication system

SC = Control lubrication system



3.5 Nameplate

Example: CMS71L electric cylinder

SEW-EURODRIVE		CE	
76646 Bruchsal/Germany			
Typ	CMS 71L/B/TF/AS1H/SB10/KGT		
Nr.	01.12345678.01.0001.06		
Mo	9.5	Nm	Io
			6.2 A
U max	400 V		
M max	31.4	Nm	I max
			25.0 A
F max	17.0 kN		
n _N	3000	1/min	n _{max}
			3000 1/min
f _N	150 Hz		
Bremse	24 V	19 Nm	
Spindel	KGT	P	10 mm/Umdr.
Hub	200 mm		
Masse	17	kg	Isol. Kl.
			F
IP	45		
Schmierstoff	Fuchs RENOLIT CX-TOM 15		
0594 927 0	Permanentmagnet	Made in Germany	

60187AXX

Typ	Motor type
Nr.	Serial number
M_o	Standstill torque (thermal continuous torque at low speeds)
I_o	Standstill current
U_{max}	Maximum permitted voltage
M_{max}	Maximum motor torque
I_{max}	Maximum permitted motor current
F_{max}	Maximum feed thrust
n_N	Rated speed
n_{max}	Max. speed
f_N	Rated frequency
Bremse	Rated voltage of brake/braking torque
Spindel	Threaded spindle
P	Spindle pitch
Hub	Stroke length
Masse	Mass
Isol.Kl.	Thermal class
IP	Enclosure
Schmierstoff	Lubricant



3.6 Mechanical and electrical characteristics

3.6.1 CMS50S

Version	CMS50S	
	Standard	Optional
Enclosure	IP65	–
Thermal class	F	–
Motor protection	KTY	–
Ambient temperature	–20 °C to +40 °C (–4.0 °F to +104 °F)	–
Mounting position	Any	Any
Standardization	CE VDE	CSA (on request) NEMA (on request) UL (on request)
Noise levels / EN 60034	Below specified value	–
Feedback	2-pole resolver RH1M	Absolute encoder AS1H
Brake	–	B (24 V holding brake)
Cooling	Natural convection	–
Cogging	$\leq 1.5\% M_0$	–
Lubrication	Via housing bore, taper greasing nipple DIN 71412	
Mounting	Center flange, rod end bearing	Flange, pivot bearing

Version	CMS50S
Threaded spindle type	Recirculating ball screw (KGT)
Positioning accuracy (repeat accuracy) If force and temperature are constant	± 0.05 mm (2 mil)
Maximum force	5.3 kN (1200 lbf)
Rated thrust	1.3 kN (290 lbf)
Rated speed	3000 / 4500
Spindle pitch	5 mm (0.2 in) per revolution
Stroke length	70 mm (2.8 in) / 150 mm (5.91 in) (300 mm [11.8 in.] in preparation)
Spindle protection	Smooth shaft with seal
Holding brake	4.3 Nm (37 in-lb)
Feedback	RH1M AS1H



3.6.2 CMS71L

Version	CMS71L	
	Standard	Optional
Enclosure	IP45 (IP65) ¹⁾	–
Thermal classification	F	–
Motor protection	TF	TF/KTY
Ambient temperature	–20 °C to +40 °C (–4.0 °F to +104 °F)	
Mounting position	Any	Any
Standardization	CE VDE	CSA (on request) NEMA (on request) UL (on request)
Noise levels / EN 60034	Below specified value	–
Feedback	2-pole resolver RH1M	Absolute encoder AS1H
Brake	–	B (24 V holding brake)
Cooling	Natural convection	
Cogging	≤ 3 % M ₀	
Lubrication	Fixed lubrication point with taper greasing nipple DIN 71412	Permanent lubrication system Perma
Mounting	Fixed	Cardan joint

1) For electrical components

Version	CMS71L
Threaded spindle type	Recirculating ball screw (KGT) Planetary roller screw drive (PGT)
Positioning accuracy (repeat accuracy) If force and temperature are constant	±0.05 mm (2 mil)
Maximum force	
Recirculating ball screw (KGT)	17 kN (3800 lbf) (max. M = 31.4 Nm [272 in-lb])
Planetary roller screw drive (PGT)	20 kN (4500 lbf) (mechanical load limit)
Rated thrust ¹⁾	
Recirculating ball screw (KGT)	4 kN (900 lbf)
Planetary roller screw drive (PGT)	8 kN (1800 lbf)
Rated speed	2000 / 3000 / 4500
Spindle pitch	
Recirculating ball screw (KGT)	10 mm (0.40 in) per revolution
Planetary roller screw drive (PGT)	5 mm (0.2 in) per revolution
Stroke length	200 mm (7.87 in), 350 mm (13.8 in)
Spindle protection	Bellows
Holding brake	19 Nm (164 in-lb)
Feedback	RH1M AS1H

1) Speed 5 to 50 rpm



3.6.3 CMS71M

Version	CMS71M	
	Welding tong version	Optional
Enclosure	IP45 (IP65) ¹⁾	–
Thermal classification	F	–
Motor protection	KTY	–
Ambient temperature	–20 °C to +40 °C (–4.0 °F to +104 °F)	–
Mounting position	Any	–
Standardization	CE VDE	–
Noise levels / EN 60034	Below specified value	–
Feedback	2-pole resolver RH1M	–
Brake	Without brake	B (24 V holding brake)
Cooling	Natural convection	–
Cogging	≤ 3 % M ₀	–
Lubrication	Fixed lubrication point with taper greasing nipple DIN 71412	–
Mounting	Special mount-on components	–

1) For electrical components

Welding tong version	CMS71M
Threaded spindle type	Planetary roller screw drive (PGT)
Positioning accuracy (repeat accuracy) If force and temperature are constant	±0.05 mm (2 mil)
Maximum force	20 kN (4500 lbf) (mechanical load limit)
Rated thrust ¹⁾	5.3 kN (1200 lbf)
Rated speed	3000
Spindle pitch	5 mm (0.2 in) per revolution
Stroke length	155 mm (6.19 in)
Spindle protection	Bellows
Holding brake	1.2 Nm (0.89 lbf/ft)
Feedback	RH1M

1) Speed 5 to 50 rpm

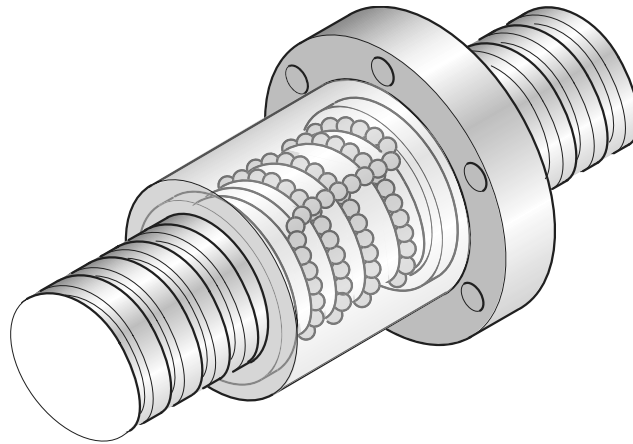


3.7 Operating principle of the recirculating ball screw and planetary roller screw drive

We differentiate between the two following threaded spindle types for electric cylinders:

3.7.1 Recirculating ball screw (KGT)

The recirculating ball screw is used in the **CMS50S** and **CMS71L** electric cylinders.



59566AXX

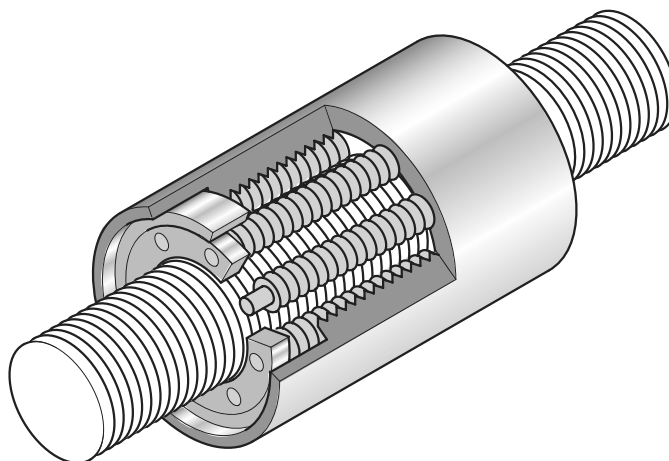
The recirculating ball screw transfers the load from the threaded spindle to the nut via ball bearings (power transmission by ball bearings).

3.7.2 Planetary roller screw drive (PGT)

The planetary roller screw drive is used in the **CMS71L/M** electric cylinders.

Preferred application areas:

- Low feed rate and high force
- Unfavorable operating conditions such as pressing



59565AXX

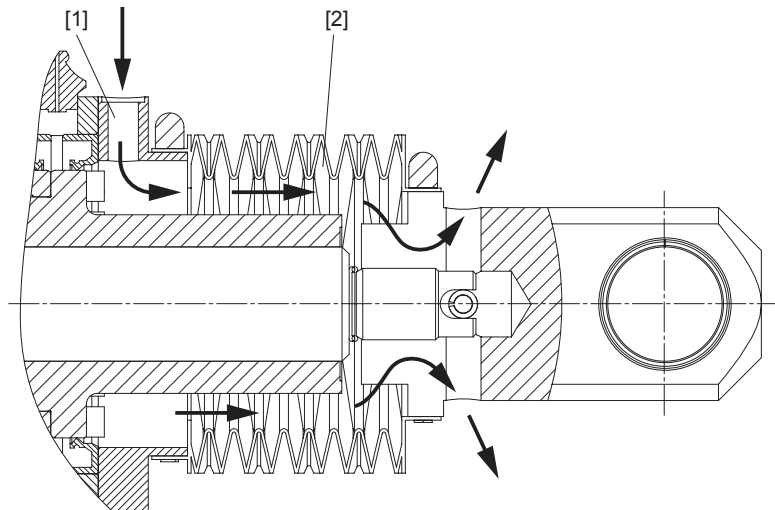
The planetary roller screw drive transfers the load from the threaded spindle to the nut via the convex thread edges of rollers (power transmission by planetary rollers).



3.8 Sealing air

The drive is factory-equipped as standard with a sealing air connection [1], thread G1/8 (not CMS71M). Because of this, the electric cylinder can especially be used in dusty environments.

To do this, the space within the bellows [2] can be placed under slight positive pressure (max. 0.5 bar). The positive pressure prevents dust, etc., from entering into the motor.



61004AXX

- [1] Sealing air connection
[2] Bellows

The pressurized air volume flow ($V_{\text{Sealingair}}$) that is required depends on the travel speed (v) of the threaded spindle.

$V_{\text{Sealingair}} \geq 300 \times v$	Volume flow $V_{\text{Sealingair}}$ [Liter/min]
	Travel speed v [m/s]

This ensures that sufficient pressurized air flows in during extension and that no negative pressure develops in the space [2].

The pressurized air must be dry and free of oil, according to DIN-ISO 8573-1 class 3 (common in pressurized air systems).

Example:

Traveling velocity: 0.5 m/s (20 in/s)

$$V_{\text{Sealingair}} \geq 300 \times 0.5 \text{ m/s} \geq 150/\text{min}$$



4 Mechanical Installation



It is imperative that you observe the safety notes in section 2 during installation.

4.1 Before you begin

**The drive
may only be
installed if:**

- The entries on the nameplate of the drive or the output voltage of the frequency inverter match the voltage supply system.
- The drive is undamaged (no damage caused by transportation or storage).
- You are certain that the following requirements have been fulfilled:
 - Ambient temperature between -20 °C and $+40\text{ °C}$ (-4 °F and $+104\text{ °F}$)
 - No oil, acid, gas, vapors, radiation, etc.
 - Installation altitude max. 1000 m (3280 ft) above sea level.
 - Special design: Drive configured in accordance with the ambient conditions.

4.2 Preliminary work

**Extended storage
of electric
cylinders**

- Please note the reduced grease service life of the ball bearings and the threaded spindle after storage periods exceeding one year.



4.3 *Installing the electric cylinder*

**Burns hazard**

Touching the CMS electric cylinder when it has not been cooled can result in burns. The CMS electric cylinder can have a surface temperature of over 65 °C (149 °F).

Provide preventive measures against inadvertent contact.



- Protect the bellows and threaded spindle against mechanical damage.
- Do not butt or hammer the spindle end.

4.3.1 Installation on site



The threaded spindle may not be subjected to overhung loads and bending moments.

Carefully align the electric cylinder and the driven machine to avoid placing any unacceptable strain on the spindle (observe permissible axial load data!). Observe the notes in section 4.6.



The electric cylinder must be installed on a level, vibration-damping and torsionally rigid support structure.



Make sure the customer's counter-bearing is unobstructed and can move freely.



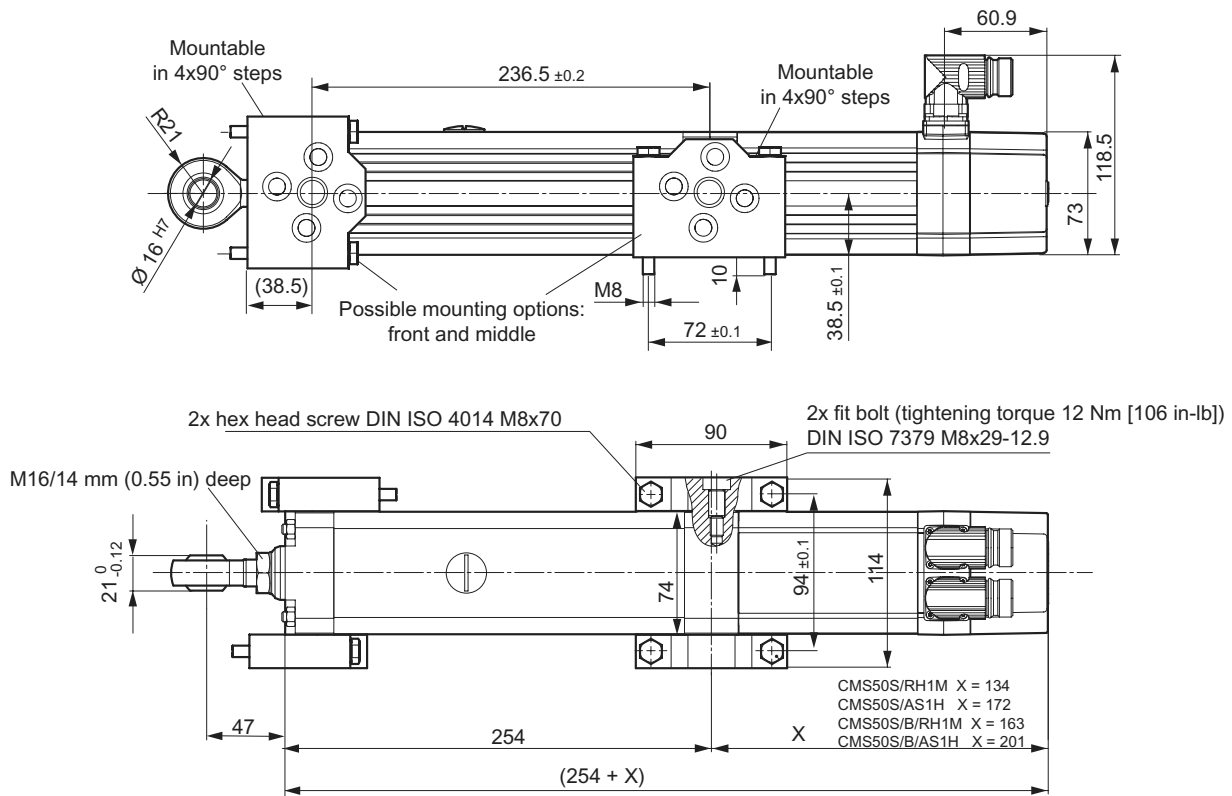
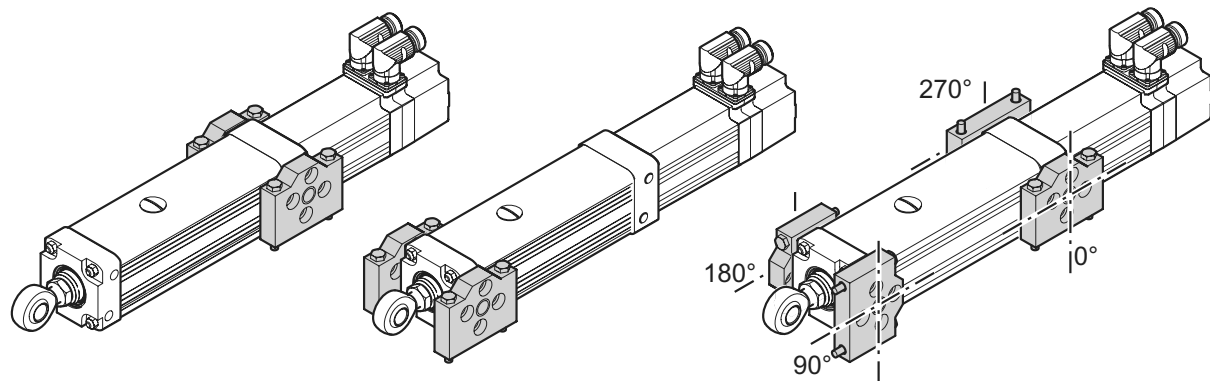
Mechanical Installation

Mounting dimensions for CMS50S

4.4.2 Additional mounting options

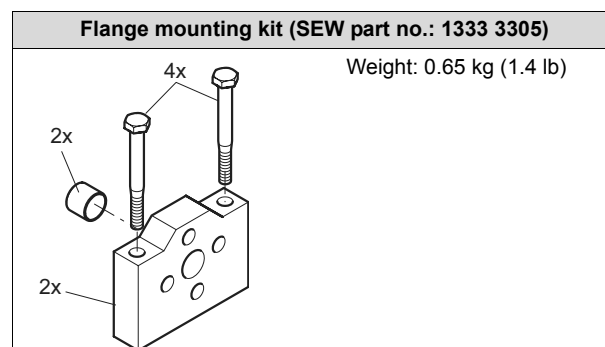
Flange mounting

The following three figures show the mounting options for the electric cylinder. This should be attached to a mounting surface with the gray-shaded mount-on components. The mount-on components can be mounted in 90° steps.



61493AEN

The flange mounting kit consists of the following parts:





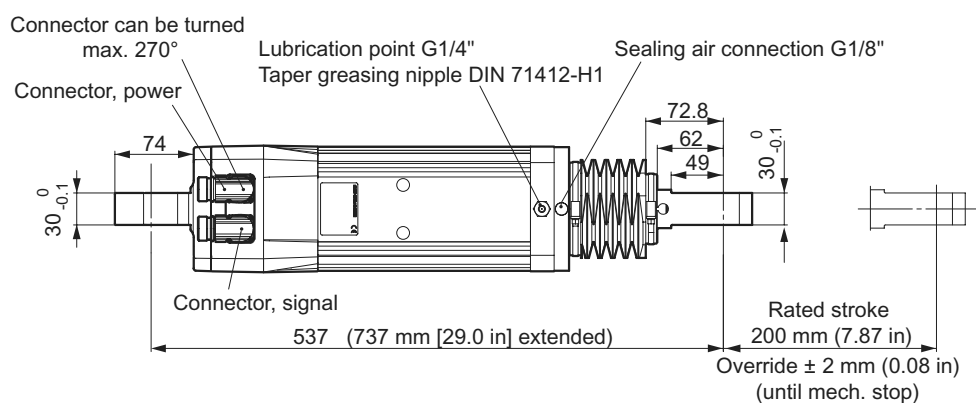
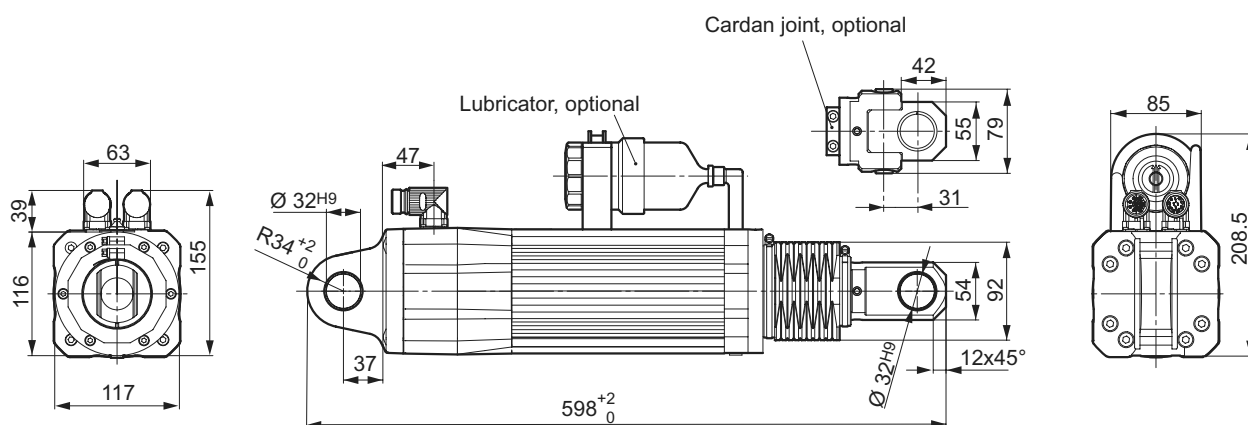
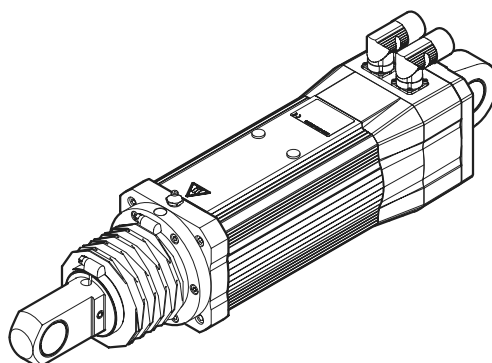
Mechanical Installation

Mounting dimensions for CMS71L

4.5 Mounting dimensions for CMS71L

4.5.1 CMS71L/B/RH1M (Resolver)

Same mounting dimensions for with/without brake and for fixed/cardan joint.



60220AEN

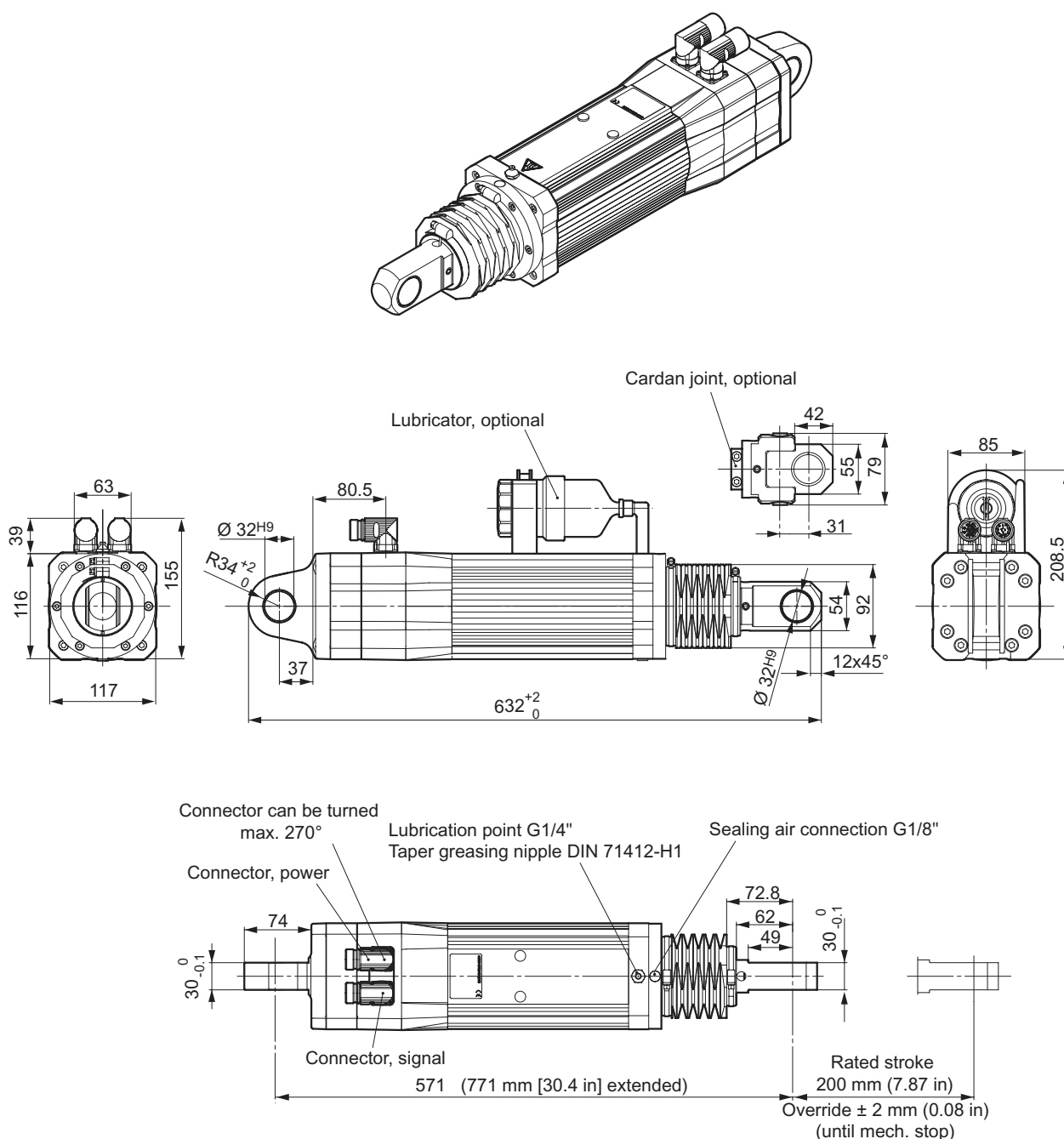


4.5.2 CMS71L/B/AS1H (absolute encoder)

Same mounting dimensions for with/without brake and for fixed/cardan joint



For design versions with an absolute encoder, the total length is 34 mm (1.3 in) greater.



60212AEN



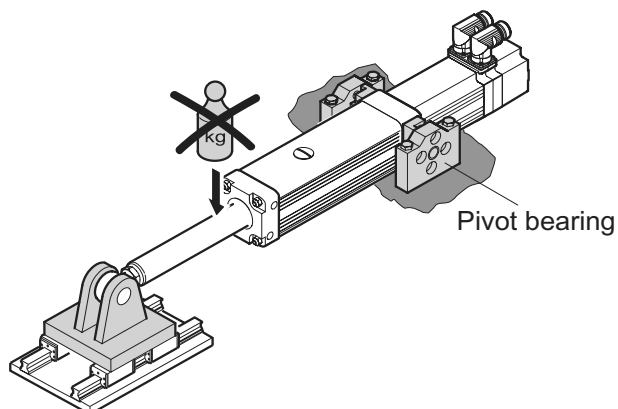
Mechanical Installation

Installation on site, customer-provided

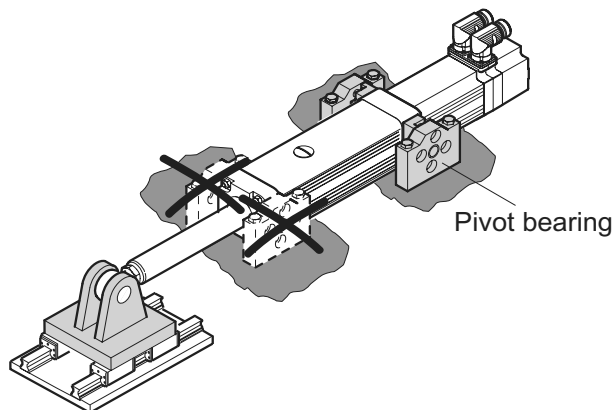
4.6 Installation on site, customer-provided

4.6.1 Installation notes CMS50S

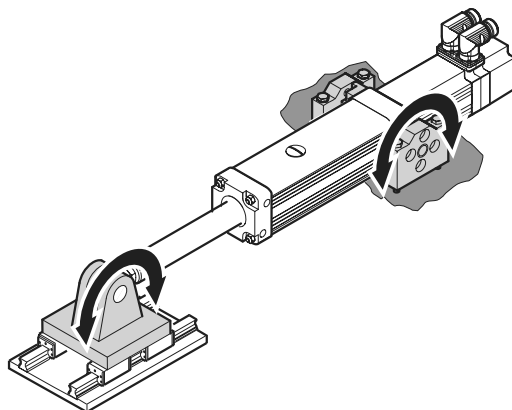
- No overhung loads on the drive



- No statically redundant mounting. When using a pivot bearing, do not use additional attachments.

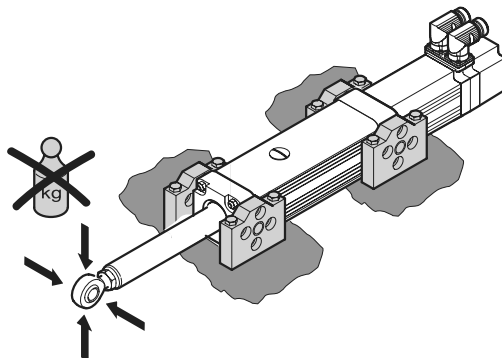


- Joints must be free to move; do not clamp in place.

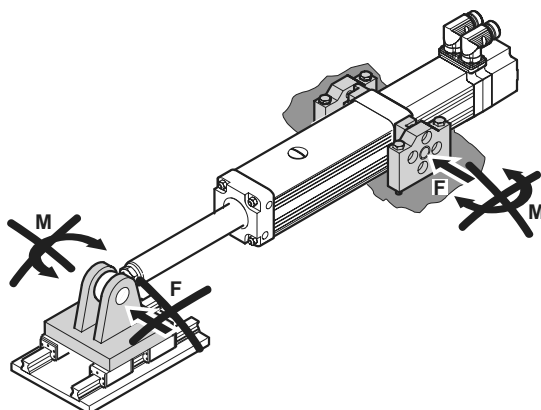




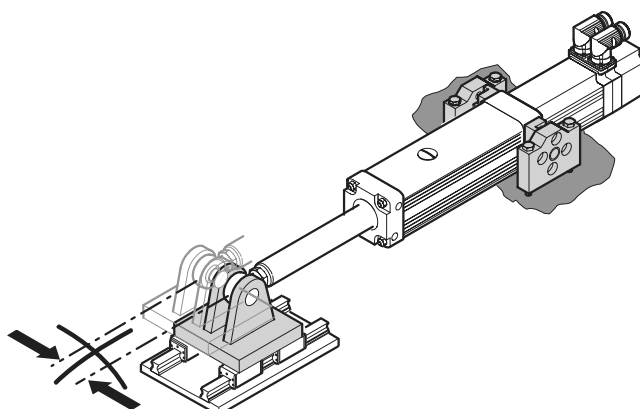
- No overhung loads on the drive



- Do not induce loads and torques via joints.



- Do not offset the installed components.

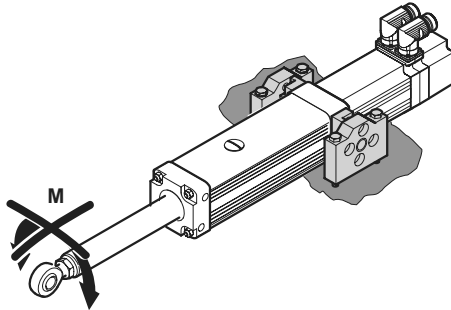




Mechanical Installation

Installation on site, customer-provided

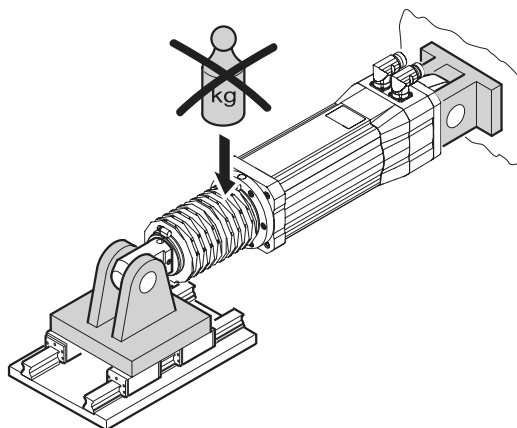
- Do not induce torque loads over the piston rod.



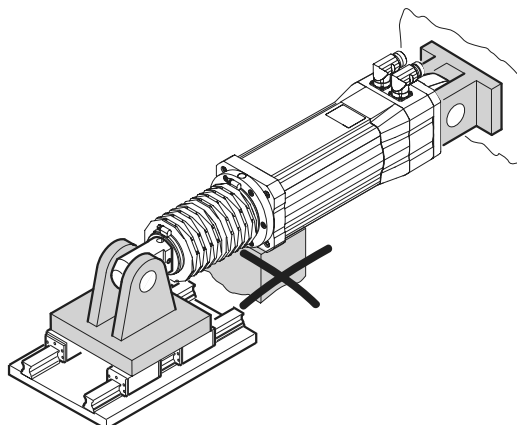


4.6.2 Installation notes CMS71L/M

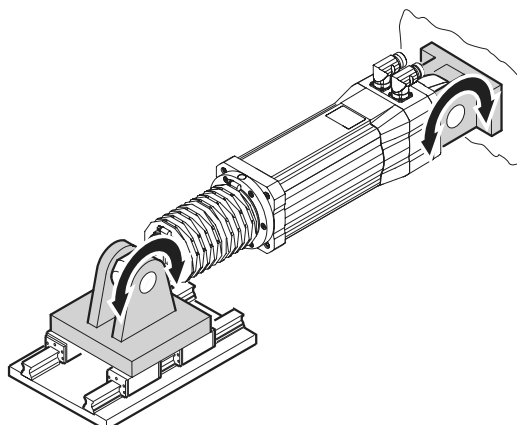
- No overhung loads on the drive



- No additional fastenings or supports (statically redundant)



- Joints must be free to move; do not clamp in place.

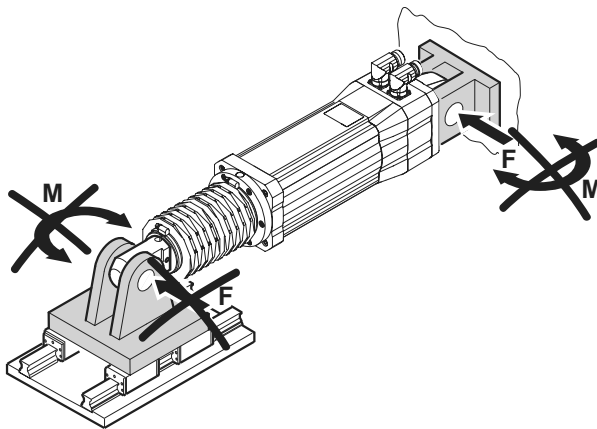




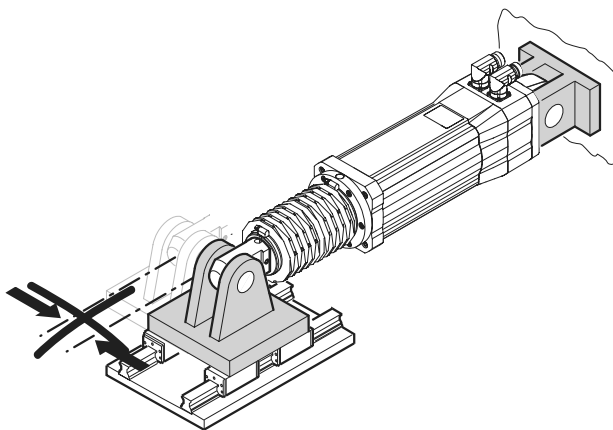
Mechanical Installation

Installation on site, customer-provided

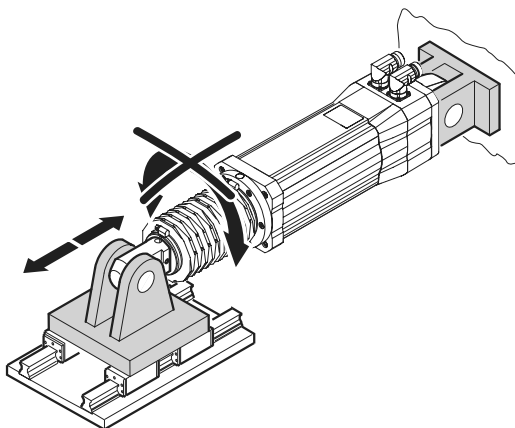
- Do not induce loads and torques via joints.



- Do not offset from the mounting position; installation tolerances in section 4.6.4.



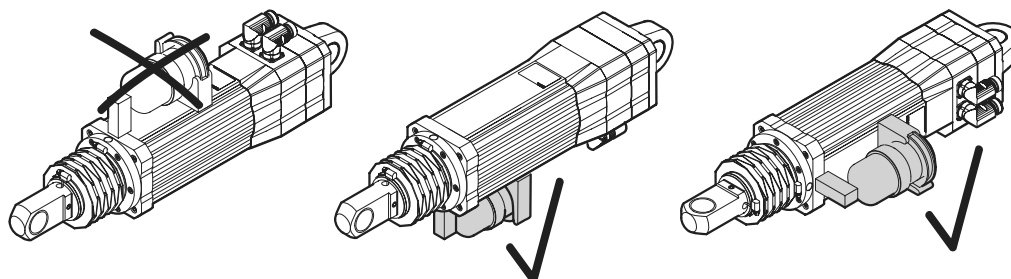
- Install so that the unit is not subject to torque (torsion).





Horizontal mounting position

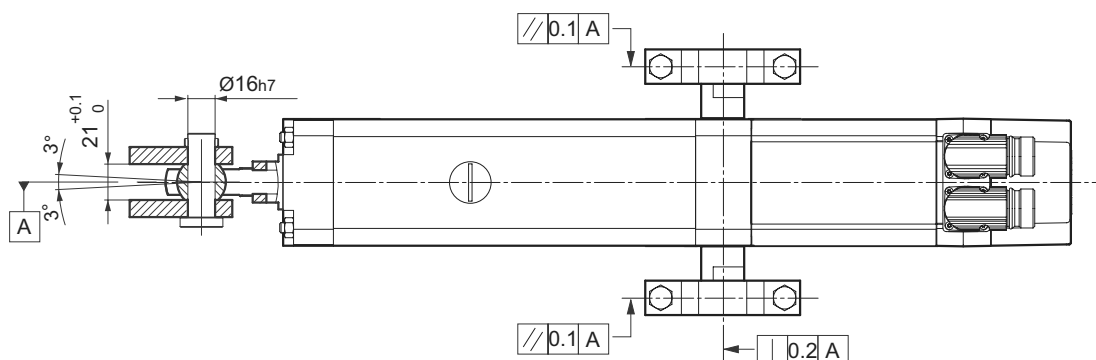
When using the **horizontal** mounting position and the optional lubricator: the lubricator should be mounted on the side or below. If this mounting situation cannot be avoided, contact SEW-EURODRIVE.



61504AXX

4.6.3 Tolerances for mounting by customer: CMS50S

The following graphic describes the mounting situation for both mounting sides of the drive.



61542AXX



Mechanical Installation

Installation on site, customer-provided

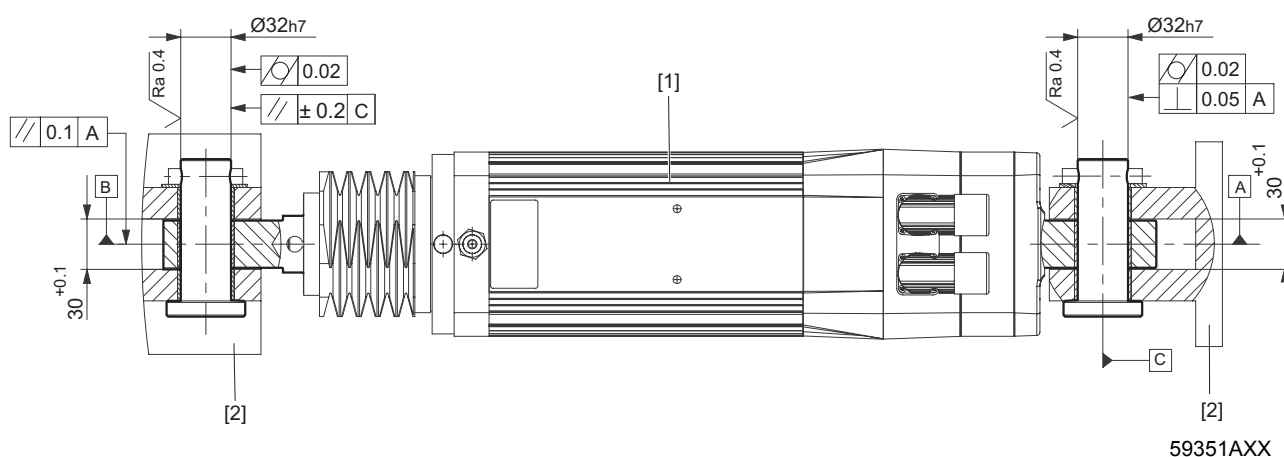
4.6.4 Tolerances for mounting by customer: CMS71L/M

The following graphic describes the mounting situation for both mounting sides of the drive.



This applies correspondingly for CMS71M with special mount-on components.

Standard CMS71L



- [1] CMS electric cylinder
[2] Customer-supplied parts

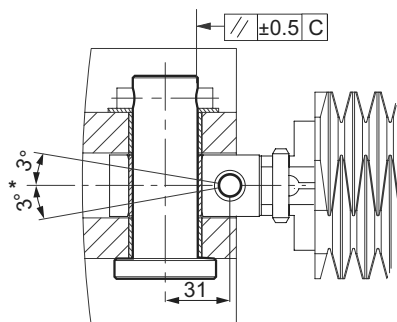
Note the following points:



- Max. axial offset between A-B ± 0.2 mm (8 mil)
- The parts supplied by the customer must meet the requirements described above.
- If mounting tolerances cannot be complied with, contact SEW-EURODRIVE. An electric cylinder with a cardan joint may fit the mounting situation.



Cardan joint



61543AXX

Note the following points:



- * With a cardan joint $\pm 3^\circ$ possible
- Max. axial offset between A-B ± 0.5 mm (20 mil)



5 Electrical Installation



- It is imperative that you observe the safety notes in section 2 during installation.
- Use switch contacts in utilization category AC-3 according to EN 60947-4-1 for connecting the brake.
- When electric cylinders are powered from inverters, the wiring instructions issued by the inverter manufacturer must be followed. It is essential that you observe the operating instructions for the servo controller.

5.1 Connector installation



Not for the CMS71M with special connector.

The cable entry of the power and signal cable is installed using an adjustable right-angle connector. Once the mating connector has been plugged in, the right-angle connector can be adjusted as required without using additional tools. A torque of approximately 10 Nm (87 in-lb) is required to adjust the connector.



The connector can be damaged if it is installed incorrectly.

If the connector is tightened when it is installed in the wrong position, the insulator could slip, causing irreparable damage.

Note the following points when plugging in the power and signal connector:

- Check that the connector is installed in the correct position.
- Check that the detent on the connector is positioned correctly.
- Make sure that the connector lock can be turned without having to apply too much force.



Comply with the permitted bending radii of the cables.

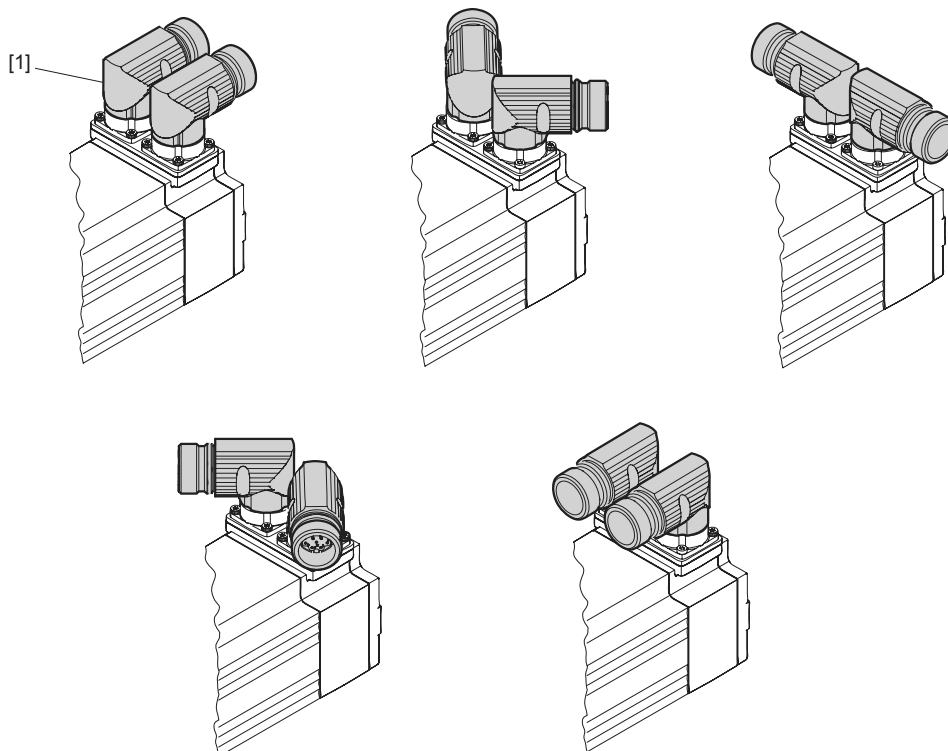
The right-angle connectors can be rotated to achieve the required position.



The connector should only be rotated to install and connect the motor. Do not turn the connector regularly once it has been installed.



Positions of the adjustable connectors (examples)



61829AXX

[1] Delivery status = standard connector position "A"



5.2 Wiring notes

Protecting against interference by brake controllers

Do not route unshielded brake cables alongside switched-mode power cables, since brake controllers may cause interference.

Switched-mode power cables include in particular:

- Output cables from frequency inverters and servo inverters, converters, soft start units and brake units
- Supply cables to braking resistors and similar.

Protecting against interference by motor protection devices



Install the connecting lead of the KTY separately from other power cables, maintaining a distance of at least 200 mm (8 in). The cables can only be routed together if either the KTY cable or the power cable is shielded.

To protect against interference from motor protection devices (temperature sensors TF or KTY):

- Route separately shielded supply cables together with switched-mode power lines in one cable
- Do not route unshielded supply cables together with switched-mode power lines in one cable

EMC measures

SEW-EURODRIVE electric cylinders are designed for use as components for installation in machinery and systems. The designer of the machine or system is responsible for complying with the EMC directive 89/336/EEC. You will find detailed information on this topic in the SEW publications "**Practical Drive Engineering, Project Planning for Drives**" and in "**Practical Drive Engineering, Volume 9, EMC in Drive Engineering**".



5.3 **Connecting electric cylinders and encoder systems using SM.. / SB.. plug connectors**

Electric cylinders are supplied with the SM.. / SB.. plug connector system.

In the basic version, SEW-EURODRIVE delivers electric cylinders with a flange-mounting socket on the motor side and without mating connector.

The encoder system is connected using a separate 12-pin round plug connector.

The plug connectors supplied as standard are rotatable connectors. The plug connectors can be rotated to match the customer's installation requirements.

Pre-fabricated cables

Pre-fabricated cables are available from SEW-EURODRIVE to connect the SM../ SB.. plug connector system. The cables used with the electric cylinder correspond to the brake motor cables of DFS motors. The core designation and contact assignment are listed in the following tables.

The plug connectors are depicted with the connector assignment on the cable at the connection side (back).

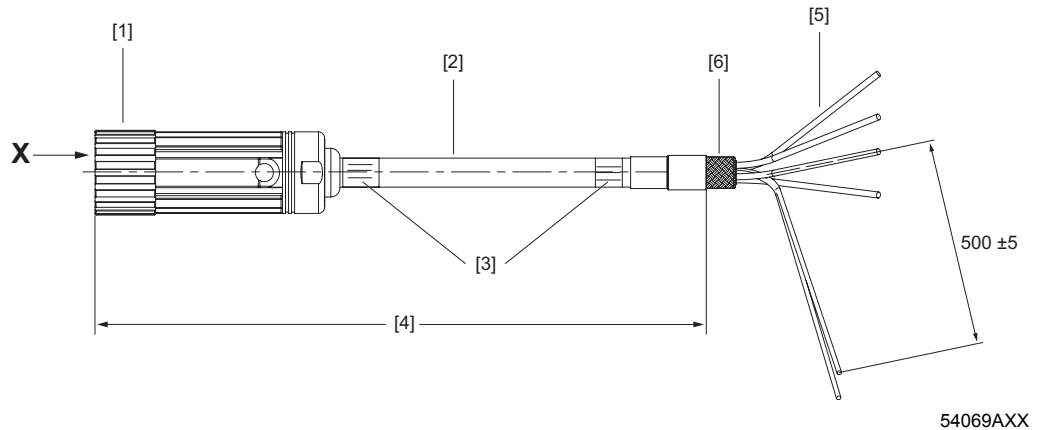
If you are making your cables yourself:

- Sec. "Appendix" describes the installation of the power plug connectors and signal plug connectors.
- The socket contacts for the motor connection are designed as crimp contacts. Only use suitable tools for crimping.
- Strip the insulation off the leads according to the installation description for power plug connectors or signal plug connectors in Sec. "Appendix". Apply shrink tubing to the connectors.
- Use only suitable removal tools to remove incorrectly installed socket contacts.



5.4 Power cable

5.4.1 Structure of the motor cable and brake motor cable



- [1] Connector: Intercontec BSTA 078
- [2] SEW-EURODRIVE logo printed on cable
- [3] Nameplate
- [4] Line length ≤ 10 m (33 ft): +200 mm (7.97 in) tolerance
Line length ≥ 10 m (33 ft): Tolerance +2%
Permitted cable length according to the technical documents
- [5] Prefabricated cable end for inverter
Required loose parts are supplied with the cable
- [6] Shielding approx. 20 mm (0.78 in), pulled back approx. + 5 mm (0.2 in)

Prefabricated cables for motor side

The power cables on the motor side consist of an 8-pin plug connector and socket contacts.

The shield is connected in the connector housing according to EMC requirements. All plug connectors seal the plug on the cable end with a lamellar seal and ensure cable relief according to EN 61884.

Prefabricated cables for inverter side

The individual cable cores of the power and brake power cables are exposed and the shield is prepared for connection in the control cabinet. The cable for the inverter end still has to be fabricated. The loose parts required are supplied with the cable in a separate bag.

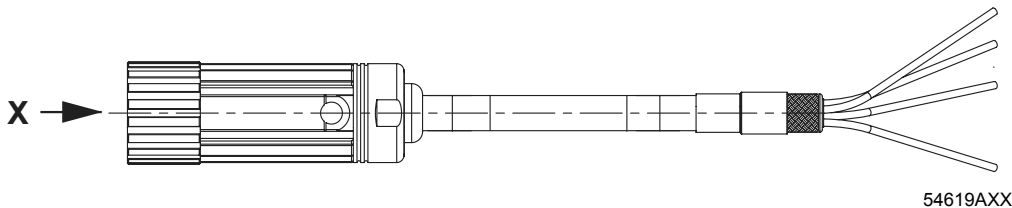
Loose parts

The following loose parts are supplied in accordance with the core cross sections for connection to the power terminals on the inverter:

Bag no.	Contents
1	4 x conductor end sleeves 1.5 mm ² , insulated 4 x M6 U-shaped cable lugs 1.5 mm ²
2	4 x conductor end sleeves 2.5 mm ² , insulated 4 x M6 U-shaped cable lugs 2.5 mm ²
3	4 x conductor end sleeves 4 mm ² , insulated 4 x M6 U-shaped cable lugs 4 mm ²



5.4.2 Motor cable



Pin assignment of the motor cable

Plug connector	Contact	Cable core color	Assigned	Extra
BSTA 078 View X	1	(BK) Black	U	Bag of loose parts
	2	(GN/YE) Green/Yellow	PE	
	3	(BK) Black	W	
	4	(BK) Black	V	

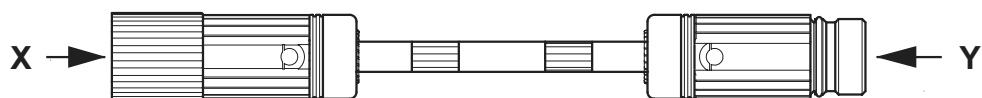
Plug connector type	Number of cores and conductor cross section	Part number	Installation type
SM11	4 x 1.5 mm ²	0590 4544	Fixed installation
SM11	4 x 1.5 mm ²	0590 6245	Cable carrier installation
SM12	4 x 2.5 mm ²	0590 4552	Fixed installation
SM12	4 x 2.5 mm ²	0590 6253	Cable carrier installation
SM14	4 x 4 mm ²	0590 4560	Fixed installation
SM14	4 x 4 mm ²	0590 4803	Cable carrier installation



Electrical Installation

Power cable

Motor extension cable



54878AXX

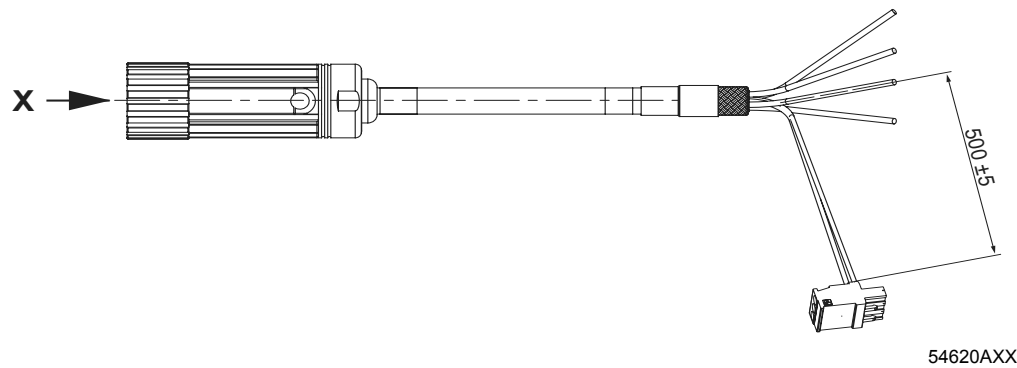
Pin assignment of the motor extension cable

Plug connector	Contact	Cable core color	Assigned	Contact	Plug connector
BSTA 078	1	(BK/WH) Black with white lettering U, V, W	U	1	BKUA 199
	4		V	4	
	3		W	3	
	2	(GR/YE) Green/Yellow	PE	2	
View X					View Y

Plug connector type	Number of cores and conductor cross section	Part number	Installation type
SM11	4 x 1.5 mm ²	1333 2457	Cable carrier installation
SM12	4 x 2.5 mm ²	1333 2465	Cable carrier installation
SM14	4 x 4 mm ²	1333 2473	Cable carrier installation



5.4.3 Brake motor cable



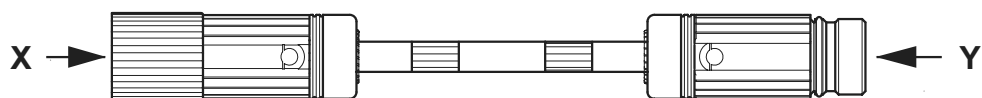
Pin assignment of the brake motor cable

Plug connector	Contact	Cable core color	Assigned	Extra
View X	1	(BK/WH) Black with white lettering U, V, W	U	Bag of loose parts
	4		V	
	3		W	
	2	(GN/YE) Green/Yellow	PE	
	A	–	Unassigned	
	B	–	Unassigned	
	C	(BK/WH) Black with white lettering 1, 2, 3	2	
	D		1	

Plug connector type	Number of cores and conductor cross section	Part number	Installation type
SB11	4 x 1.5 mm ² + 2 x 1 mm ²	1332 4853	Fixed installation
SB11	4 x 1.5 mm ² + 2 x 1 mm ²	1333 1221	Cable carrier installation
SB12	4 x 2.5 mm ² + 2 x 1 mm ²	1333 2139	Fixed installation
SB12	4 x 2.5 mm ² + 2 x 1 mm ²	1333 2155	Cable carrier installation
SB14	4 x 4 mm ² + 2 x 1 mm ²	1333 2147	Fixed installation
SB14	4 x 4 mm ² + 2 x 1 mm ²	1333 2163	Cable carrier installation



Brake motor extension cable



54878AXX

Pin assignment of the brake motor extension cable

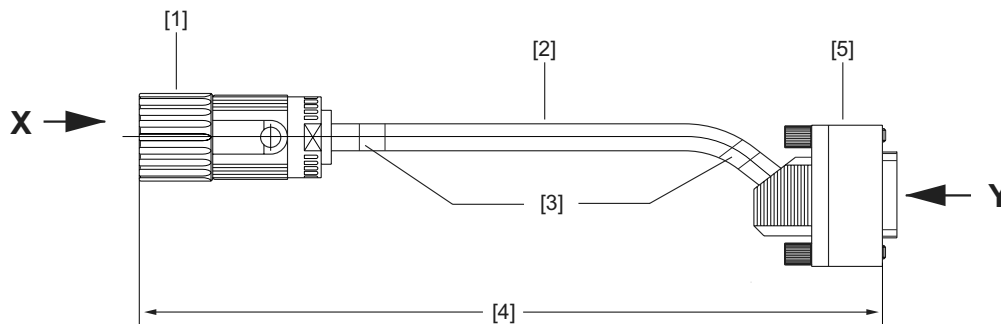
Plug connector	Contact	Cable core color	Assigned	Contact	Plug connector
BSTA 078 View X	1	(BK/WH) Black with white lettering U, V, W	U	1	BKUA 199 View Y
	4		V	4	
	3		W	3	
	2	(GN/YE) Green/Yellow	PE	2	
	A	—	Unas- signed	A	
	B	—	Unas- signed	B	
	C	(BK/WH) Black with white lettering 1, 2, 3	2	C	
	D		1	D	

Plug connector type	Number of cores and conductor cross section	Part number	Installation type
SB11	4 x 1.5 mm ² + 2 x 1 mm ²	1333 2481	Cable carrier installation
SM12	4 x 2.5 mm ² + 2 x 1 mm ²	1333 2503	Cable carrier installation
SM14	4 x 4 mm ² + 2 x 1 mm ²	1333 2511	Cable carrier installation



5.5 Feedback cable

5.5.1 Structure of the feedback cable for resolvers, HIPERFACE® encoders



54635AXX

- [1] Connector: Intercontec ASTA
- [2] Printed on connector: SEW-EURODRIVE
- [3] Nameplate
- [4] Line length ≤ 10 m (33 ft): +200 mm (7.97 in) tolerance
Line length ≥ 10 m (33 ft): Tolerance +2%
Permitted line length according to the technical documents.
- [5] Sub D plug

Prefabricated cables for motor side

A 12-pin EMC signal plug connector from Intercontec with socket contacts is used on the motor end for RH.M / AS1H / ES1H. The shield is connected in the connector housing according to EMC requirements. All plug connectors seal the plug on the cable end with a lamellar seal.

Prefabricated cables for inverter side

A commercial sub-D EMC connector with pin contacts is used on the inverter end. A 9-pin or 15-pin connector to suit the inverter is used.

Hybrid cables

The outer cable sheath on the motor and inverter end bears a nameplate with part number and logo of the prefabricated cable manufacturer. The ordered length and permitted tolerance are interrelated as follows:

- Line length ≤ 10 m (33 ft): 200 mm (7.87 in) tolerance
- Line length ≥ 10 m (33 ft): +2% tolerance



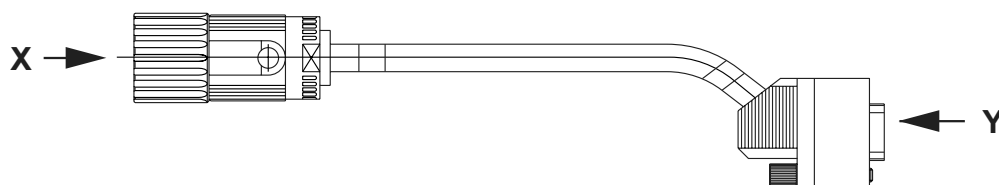
Refer to the system manual of the servo inverter for information on how to determine the maximum cable length. Make sure that an EMC-compliant environment is maintained during project planning.



Electrical Installation

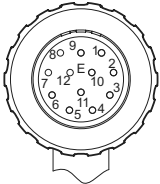
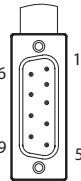
Feedback cable

5.5.2 RH.M resolver cable



54704AXX

Pin assignment of the resolver cable RH.M for MOVIDRIVE® MDX60B/61B

Motor connection side		Description	Cable core color	Description	Connection MOVIDRIVE® MDX..B	
Plug connector	Contact no.				Contact no.	Plug connector
ASTA 021FR 198 921 9 12-pin with socket contacts  View X	1	R1 (reference +)	(PK) Pink	R1 (reference +)	3	Sub-D 9-pole  View Y
	2	R2 (reference –)	(GY) Gray	R2 (reference –)	8	
	3	S1 (cosine +)	(RD) Red	S1 (cosine +)	2	
	4	S3 (cosine –)	(BU) Blue	S3 (cosine –)	7	
	5	S2 (sine +)	(YE) Yellow	S2 (sine +)	1	
	6	S4 (sine –)	(GN) Green	S4 (sine –)	6	
	7	Unassigned	–	–	–	
	8	Unassigned	–	–	–	
	9	TF/KTY+	(BN) Brown/(VT) Violet	TF (KTY+)	9	
	10	TF/KTY–	(WH) White/(BK) Black	TF/KTY–	5	
	11	Unassigned	–	–	–	
	12	Unassigned	–	Unassigned	4	

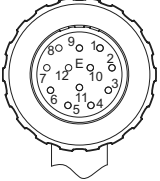
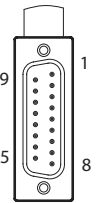
Installation	Part number
Fixed installation	0199 4875
Cable carrier installation	0199 3194



Resolver cable plug connector RH.M for MOVIAXIS® MX



Pin assignment of the resolver cable plug connector RH.M for MOVIAXIS® MX

Motor connection side					MOVIAXIS® MX connection	
Plug connector	Contact no.	Description	Cable core color	Description	Contact no.	Plug connector
ASTA 021FR 198 921 9 12-pin with socket contacts  View X	1	R1 (reference +)	(PK) Pink	R1 (reference +)	5	Sub-D 15-pole  View Y
	2	R2 (reference –)	(GY) Gray	R2 (reference –)	13	
	3	S1 (cosine +)	(RD) Red	S1 (cosine +)	2	
	4	S3 (cosine –)	(BU) Blue	S3 (cosine –)	10	
	5	S2 (sine +)	(YE) Yellow	S2 (sine +)	1	
	6	S4 (sine –)	(GN) Green	S4 (sine –)	9	
	7	Unassigned	–	Unassigned	3	
	8	Unassigned	–	Unassigned	4	
	9	TF/KTY +	(BN) Brown/(VT) Violet ¹⁾	TF/KTY +	14	
	10	TF/KTY –	(WH) White/(BK) Black ¹⁾	TF/KTY –	6	
	11	Unassigned	–	Unassigned	7	
	12	Unassigned	–	Unassigned	8	
		–	–	Unassigned	11	
		–	–	Unassigned	12	
		–	–	Unassigned	15	

1) Double assignment to increase cross section

All connectors are shown with view onto the pins.

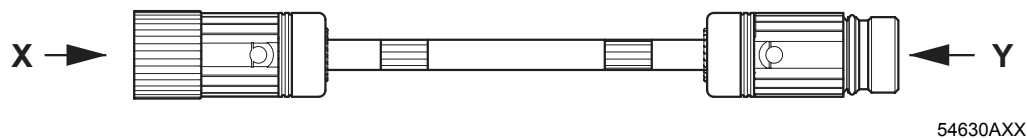
Installation	Part number
Fixed installation	1332 7429
Cable carrier installation	1332 7437



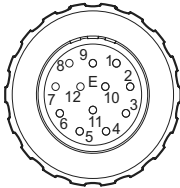
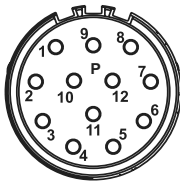
Electrical Installation

Feedback cable

Extension cable for resolver RH.M



Pin assignment of the extension cable for resolver RH.M

Plug connector	Contact no.	Description	Cable core color	Description	Contact no.	Plug connector
ASTA 021FR 198 673 2 12-pin with socket contacts  View X	1	R1 (reference +)	(PK) Pink	R1 (reference +)	1	AKUA 020MR 199 647 9 12-pin with pin contacts  View Y
	2	R1 (reference –)	(GY) Gray	R1 (reference –)	2	
	3	S1 (cosine +)	(RD) Red	S1 (cosine +)	3	
	4	S3 (cosine –)	(BU) Blue	S3 (cosine –)	4	
	5	S2 (sine +)	(YE) Yellow	S2 (sine +)	5	
	6	S4 (sine –)	(GN) Green	S4 (sine –)	6	
	7	Unassigned	–	Unassigned	7	
	8	Unassigned	–	Unassigned	8	
	9	TF/KTY +	(BN) Brown/(VT) Violet ¹⁾	TF/KTY +	9	
	10	TF/KTY –	(WH) White/(BK) Black ¹⁾	TF/KTY –	10	
	11	Unassigned	–	Unassigned	11	
	12	Unassigned	–	Unassigned	12	

1) Double assignment to increase cross section

The extension cable has the same pin assignment as all other contacts.

Installation	Part number
Fixed installation	0199 5421
Cable carrier installation	0199 5413

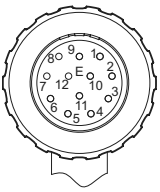
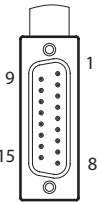


5.5.3 Cable for HIPERFACE® encoder plug connector for MOVIDRIVE® B and MOVIAXIS® MX

HIPERFACE® encoder plug connector for MOVIDRIVE® B and MOVIAXIS® MX



Pin assignment of the cable for HIPERFACE® encoder AS1H / ES1H

Motor connection side				Connection MOVIAXIS® MX MOVIDRIVE® MDX..B		
Plug connector	Contact no.	Description	Cable core color	Description	Contact no.	Plug connector
ASTA 021FR 198 921 9 12-pin with socket contacts  View X	1	Unassigned	Unassigned	Unassigned	3	Sub-D 15-pole  View Y
	2	Unassigned	Unassigned	Unassigned	5	
	3	S1 (cosine +)	(RD) Red	S1 (cosine +)	1	
	4	S3 (cosine –)	(BU) Blue	S3 (cosine –)	9	
	5	S2 (sine +)	(YE) Yellow	S2 (sine +)	2	
	6	S4 (sine –)	(GN) Green	S4 (sine –)	10	
	7	DATA–	(VT) Violet	DATA–	12	
	8	DATA+	(BK) Black	DATA+	4	
	9	TF/KTY +	(BN) Brown	TF/KTY +	14	
	10	TF/KTY –	(WH) White	TF/KTY –	6	
	11	GND	(GY/PK) Gray/Pink ¹⁾	GND	8	
	12	U _s	(RD/BU) Red/Blue ¹⁾	U _s	15	
		–	–	Unassigned	7	
		–	–	Unassigned	11	
		–	–	Unassigned	13	

1) Double assignment to increase cross section

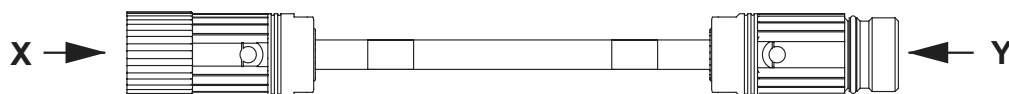
Installation	Part number
Fixed installation	1332 4535
Cable carrier installation	1332 4551



Electrical Installation

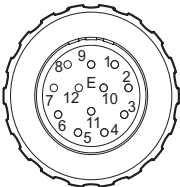
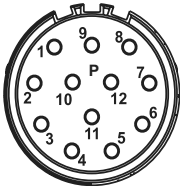
Feedback cable

Extension cables for HIPERFACE® encoder AS1H / ES1H



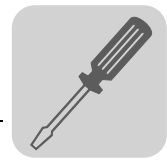
54634AXX

Pin assignment of extension cable for HIPERFACE® encoder AS1H / ES1H

Plug connector	Contact no.	Description	Cable core color	Description	Contact no.	Plug connector
ASTA 021FR 198 673 2 12-pin with socket contacts  View X	1	Unassigned	–	Unassigned	1	AKUA 020MR 199 647 9 12-pin with pin contacts  View Y
	2	Unassigned	–	Unassigned	2	
	3	S1 (cosine +)	(RD) Red	S1 (cosine +)	3	
	4	S3 (cosine –)	(BU) Blue	S3 (cosine –)	4	
	5	S2 (sine +)	(YE) Yellow	S2 (sine +)	5	
	6	S4 (sine –)	(GN) Green	S4 (sine –)	6	
	7	DATA–	(VT) Violet	DATA–	7	
	8	DATA+	(BK) Black	DATA+	8	
	9	TF/KTY +	(BN) Brown	TF/KTY +	9	
	10	TF/KTY –	(WH) White	TF/KTY –	10	
	11	GND	(GY/PK) Gray/Pink / (PK) Pink	GND	11	
	12	U _s	(RD/BU) Red/Blue / (GY) Gray	U _s	12	

The extension cable has the same pin assignment as all other contacts.

Installation	Part number
Fixed installation	0199 5391
Cable carrier installation	0199 5405



5.6 Mating connector combinations



Mating connectors are not included in the scope of delivery and must be ordered separately. Order mating connectors based on the cable cross section.



Cable type		Cable cross-section	Part number Power connector
Fixed installation	Motor cable	4 x 1.5 mm ²	0198 6740
		4 x 2.5 mm ²	0198 6740
		4 x 4 mm ²	0199 1639
	Brake motor cable ¹⁾	4 x 1.5 mm ² + 2 x 1 mm ²	0198 6740
		4 x 2.5 mm ² + 2 x 1 mm ²	0198 6740
		4 x 4 mm ² + 2 x 1 mm ²	0199 1639
Cable carrier installation	Motor cable	4 x 1.5 mm ²	0198 6740
		4 x 2.5 mm ²	0198 9197
		4 x 4 mm ²	0199 1639
	Brake motor cable ¹⁾	4 x 1.5 mm ² + 2 x 1 mm ²	0198 9197
		4 x 2.5 mm ² + 2 x 1 mm ²	0198 9197
		4 x 4 mm ² + 2 x 1 mm ²	0199 1639

1) 3-core cable, only 2 cores are used

Cable type		Cable cross-section	Part number Signal connector
Fixed cable carrier installation	Resolver cable	5 x 2 x 0.25 mm ²	0198 6732
	Encoder cable	6 x 2 x 0.25 mm ²	

The complete set of the mating connectors always includes the following parts:

- Feedback/power connector,
- Insulation inserts,
- Socket contacts.



5.7 Cable specification

5.7.1 Fixed installation of the motor cable

Manufacturer:
HELUKABEL

Installation type		Fixed				
Cable cross sections		4 x 1.5 mm ²	4 x 2.5 mm ²	4 x 4 mm ²	4 x 6 mm ²	4 x 10 mm ²
Manufacturer		HELUKABEL				
Manufacturer designation						
Operating voltage V ₀ / V AC	[V]	600 / 1000				
Temperature range	[°C] ([°F])	Fixed installation –40 to +80 (–40 to +176)				
Max. temperature	[°C] ([°F])	+80 (+176)				
Min. bending radius	[mm] ([in])	45 (1.8)	55 (2.2)	65 (2.6)	71.5 (2.81)	85 (3.3)
Diameter D	[mm]	9.0 ± 0.2	11 ± 0.2	13 ± 0.2	14.3 ± 0.3	17.0 ± 0.6
Core identification		BK with lettering WH + GN/YE				
Sheath color		Orange, similar to RAL 2003				
Approval(s)		DESINA/VDE/UL				
Capacitance core/shielding	[nF/km]	110	110	118	125	125
Capacitance core/core	[nF/km]	70	70	75	80	80
Halogen-free		No				
Silicone-free		Yes				
CFC-free		Yes				
Inner insulation (core)		PP				
Outer insulation (sheath)		PVC				
Flame-inhibiting/ self-extinguishing		No				
Conductor material		Cu				
Shielding		Tinned Cu				
Weight (cable)	[kg/km] ([lb/mi])	134 (475)	202 (717)	262 (929)	332 (1180)	601 (2130)



Manufacturer:
Lapp



Not for new designs

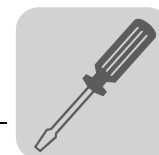
Installation type		Fixed		
Cable cross sections		4 × 1.5 mm ²	4 × 2.5 mm ²	4 × 4 mm ²
Manufacturer		Lapp		
	Unit			
Manufacturer designation		PVC/C/TPE		
Operating voltage V ₀ / V AC	[V]	600 / 1000		
Temperature range	[°C] ([°F])	Fixed installation –10 to +90 (+14 to +194)		
Max. temperature	[°C] ([°F])	90 (194)	90 (194)	90 (194)
Min. bending radius	[mm] ([in])	44 (1.7)	48 (1.9)	56 (2.2)
Diameter D	[mm]	9.3 ± 0.3	10 ± 0.3	12.3 ± 0.3
Core identification		BK with lettering WH + GN/YE		
Sheath color		Orange, similar to RAL 2003		
Approval(s)		DESINA/VDE/UL		
Capacitance core/shielding	[nF / km]	135	140	150
Capacitance core/core	[nF / km]	75	85	90
Halogen-free		No		
Silicone-free		Yes		
CFC-free		No		
Inner insulation (core)		TPE		
Outer insulation (sheath)		PVC		
Flame-retardant / self-extinguishing		No		
Conductor material		Cu		
Shielding		Tinned Cu		
Weight (cable)	[kg/km] ([lb/mi])	196 (694)	254 (899)	371 (1310)



5.7.2 Cable carrier installation for motor cables

Manufacturer:**Nexans**

Installation type		Cable carrier				
Cable cross sections		4 x 1.5 mm ²	4 x 2.5 mm ²	4 x 4 mm ²	4 x 6 mm ²	4 x 10 mm ²
Manufacturer		Nexans				
Manufacturer designation		PSL(LC)C11Y-J 4 x ... mm ²		PSL11YC11Y-J 4 x ... mm ²		
Operating voltage V ₀ / V AC	[V]	600 / 1000				
Temperature range	[°C] ([°F])	−20 to +60 (−4 to +140)				
Max. temperature	[°C] ([°F])	+ 90 (+ 194) (on conductor)				
Min. bending radius	[mm] ([in])	130 (5.12)	140 (5.51)	130 (5.12)	155 (6.10)	180 (7.09)
Diameter D	[mm]	12.3 ± 1.0	15 ± 1.5	13.1 ± 0.4	13.1 ± 0.4	17.7 ± 0.5
Maximum acceleration	[m/s ²] ([ft/s ²])	20 (66)				
Max. velocity	[m/min] ([ft/min])	200 (656) at max. travel distance of 5 m (16 ft)				
Core identification		BK with lettering WH + GN/YE				
Sheath color		Orange similar to RAL 2003				
Approval(s)		DESINA/VDE/UL/  US				
Capacitance core/shielding	[nF/km]	95	95	170	170	170
Capacitance core/core	[nF/km]	65	65	95	95	95
Halogen-free		Yes				
Silicone-free		Yes				
CFC-free		Yes				
Inner insulation (core)		Polyolefin		TPM		
Outer insulation (sheath)		TPU (PURE)				
Flame-inhibiting/ self-extinguishing		Yes				
Conductor material		E-Cu blank				
Shielding		Braided tinned Cu shield (optically covered > 85 %)				
Weight (cable)	[kg/km] ([lb/mi])	190 (673)	300 (1060)	320 (1130)	420 (1450)	640 (2270)
Min. bending cycles		≥ 5 million				



5.7.3 Fixed installation of the brake motor cable

Manufacturer:
HELUKABEL

Installation type		Fixed				
Cable cross sections		4 x 1.5 mm ² + 3 x 1 mm ²	4 x 2.5 mm ² + 3 x 1 mm ²	4 x 4 mm ² + 3 x 1 mm ²	4 x 6 mm ² + 3 x 1.5 mm ²	4 x 10 mm ² + 3 x 1.5 mm ²
Manufacturer		HELUKABEL				
Manufacturer designation						
Operating voltage V ₀ / V AC	[V]	600 / 1000				
Temperature range	[°C] ([°F])	Fixed installation: -40 to +80 (-40 to +176)				
Max. temperature	[°C] ([°F])	80 (+176)				
Min. bending radius	[mm] ([in])	59 (2.3)	67 (2.6)	75 (3.0)	85 (3.3)	100 (3.9)
Diameter D	[mm]	11.8 ± 0.4	13.4 ± 0.4	15.0 ± 0.5	17.0 ± 0.6	20.0 ± 1.0
Core identification		BK with lettering WH + GN/YE				
Sheath color		Orange similar to RAL 2003				
Approval(s)		DESINA/VDE/UL				
Capacitance core/shielding	[nF/km]	105	105	110	115	120
Capacitance core/core	[nF/km]	60	60	70	75	78
Halogen-free		No				
Silicone-free		Yes				
CFC-free		Yes				
Inner insulation (core)		PP				
Outer insulation (sheath)		PVC				
Flame-inhibiting/ self-extinguishing		No				
Conductor material		Cu				
Shielding		Tinned Cu				
Weight (cable)	[kg/km] ([lb/mi])	229 (812)	292 (1040)	393 (1390)	542 (1920)	938 (3330)



Electrical Installation

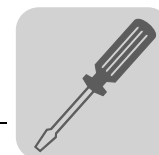
Cable specification

Manufacturer:
Lapp



Not for new designs

Installation type		Fixed		
Cable cross sections		4 x 1.5 mm ² + 3 x 1 mm ²	4 x 2.5 mm ² + 3 x 1 mm ²	4 x 4 mm ² + 3 x 1 mm ²
Manufacturer		Lapp		
	Unit			
Manufacturer designation		PVC/C/TPE		
Operating voltage V_0 / V AC	[V]	600 / 1000		
Temperature range	[°C] ([°F])	Fixed installation: -10 to + 90 (+14 to +194)		
Max. temperature	[°C] ([°F])	90 (194)	90 (194)	90 (194)
Min. bending radius	[mm] ([in])	54 (2.1)	57 (2.2)	64 (2.5)
Diameter D	[mm]	11.8 ± 0.4	13.4 ± 0.5	15.0 ± 0.5
Core identification		BK with lettering WH + GN/YE		
Sheath color		Orange similar to RAL 2003		
Approval(s)		DESINA/VDE/UL		
Capacitance core/shielding	[nF/km]	135	145	150
Capacitance core/core	[nF/km]	75	85	90
Halogen-free		No		
Silicone-free		Yes		
CFC-free		No		
Inner insulation (core)		TPE		
Outer insulation (sheath)		PVC		
Flame-retardant / self-extinguishing		No		
Conductor material		Cu		
Shielding		Tinned Cu		
Weight (cable)	[kg/km] ([lb/mi])	300 (1060)	370 (1310)	476 (1690)



5.7.4 Cable carrier installation for brake motor cables

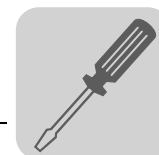
Installation type		Cable carrier				
Cable cross sections		4 x 1.5 mm ² + 3 x 1 mm ²	4 x 2.5 mm ² + 3 x 1 mm ²	4 x 4 mm ² + 3 x 1 mm ²	4 x 6 mm + 3 x 1.5 mm ²	4 x 10 mm ² + 3 x 1.5 mm ²
Manufacturer		Nexans				
Manufacturer designation		PSL(LC)C11Y-J 4x... +3A.../C		PSL11YC11Y-J 4x... +3A.../C		
Operating voltage V ₀ / V AC	[V]	600 / 1000				
Temperature range	[°C] ([°F])	−20 to +60 (−4 to +140)				
Max. temperature	[°C] ([°F])	+ 90 (+194) (conductor)				
Min. bending radius	[mm] ([in])	150 (5.51)	170 (6.69)	155 (6.10)	175 (6.89)	200 (7.87)
Diameter D	[mm]	15.0 ± 1.4	16.2 ± 0.7	15.3 ± 0.5	17.4 ± 0.5	20.5 ± 0.5
Maximum acceleration	[m/s ²] ([ft/s ²])	20 (66)				
Max. velocity	[m/min] ([ft/min])	200 (656) at max. travel distance of 5 m (16 ft)				
Core identification		BK with lettering WH + GN/YE				
Sheath color		Orange similar to RAL 2003				
Approval(s)		DESINA/VDE/UL/  US				
Capacitance core/ shielding	[nF/km]	105	105	170	170	170
Capacitance core/core	[nF/km]	65	65	95	95	95
Halogen-free		Yes				
Silicone-free		Yes				
CFC-free		Yes				
Inner insulation (cable)		TPM				
Outer insulation (sheath)		Polyolefin		TPU (PURE)		
Flame-inhibiting/ self-extinguishing		Yes				
Conductor material		E-Cu blank				
Shielding		Braided tinned Cu shield (optically covered > 85%)				
Weight (cable)	[kg/km] ([lb/mi])	220 (780)	310 (1100)	410 (1450)	540 (1920)	750 (2660)
Min. bending cycles		≥ 5 million				



5.7.5 Fixed installation of feedback cables

Manufacturer:
HELUKABEL

Installation type		Fixed	
Accessory designation		AS1H/ES1H	RH.M/RH.L
Cable cross sections		6 x 2 x 0.25 mm ²	5 x 2 x 0.25 mm ²
Manufacturer		HELUKABEL	
Manufacturer designation			
Operating voltage V ₀ / V AC	[V]	230 / 350	
Temperature range	[°C] ([°F])	Fixed installation –40 to +80 (–40 to +176)	
Max. temperature	[°C] ([°F])	+ 80 (+176)	
Min. bending radius	[mm] ([in])	43 (1.7)	36.5 (1.44)
Diameter D	[mm]	8.6 ± 0.2	7.3 ± 0.2
Core identification		DIN 47 100	
Sheath color		Green, similar to RAL 6018	
Approval(s)		DESINA / VDE /  US	
Capacitance core/shielding	[nF/km]	110	
Capacitance core/core	[nF/km]	70	
Halogen-free		No	
Silicone-free		Yes	
CFC-free		Yes	
Inner insulation (core)		PP	
Outer insulation (sheath)		PVC	
Flame-inhibiting/ self-extinguishing		No	
Conductor material		Cu blank	
Shielding		Braided tinned Cu	
Weight (cable)	[kg/km] ([lb/mi])	107 (380)	78 (277)



Manufacturer:
Lapp



Not for new designs

Installation type		Fixed	
Accessory designation		AS1H/ES1H	RH.M
Cable cross sections		6 x 2 x 0.25 mm ²	5 x 2 x 0.25 mm ²
Manufacturer		Lapp	
	Unit		
Manufacturer designation		TPE/CY	
Operating voltage V ₀ / V AC	[V]	300	
Temperature range	[°C] ([°F])	-10 to +80 (+14 to +176)	
Max. temperature	[°C] ([°F])	+80 (+176)	
Min. bending radius	[mm] ([in])	41.5 (1.63)	37.5 (1.48)
Diameter D	[mm]	8.3 ± 0.3	7.5 ± 0.3
Core identification		DIN 47 100	
Sheath color		Green, similar to RAL 6018	
Approval(s)		DESINA / VDE /  US	
Capacitance core/shielding	[nF/km]	110	
Capacitance core/core	[nF/km]	83	
Halogen-free		No	
Silicone-free		Yes	
CFC-free		No	
Inner insulation (core)		TPE	
Outer insulation (sheath)		PVC	
Flame-retardant/self-extinguishing		No	
Conductor material		Cu blank	
Shielding		Braided tinned Cu	
Weight (cable)	[kg/km] ([lb/mi])	131 (465)	103 (365)



5.7.6 Cable carrier installation of feedback cables

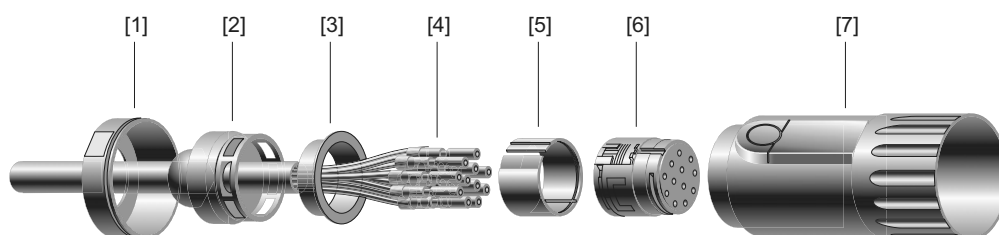
Installation type		Cable carrier		
Accessory designation		AS1H/ES1H	RH.M/RH.L	VR
Cable cross sections		6 x 2 x 0.25 mm ²	5 x 2 x 0.25 mm ²	3 x 1 mm ²
Manufacturer		Nexans		
Manufacturer designation		SSL11YC11Y ... x 2 x 0.25		PSL 3 x 1.0
Operating voltage V ₀ / V AC	[V]	300		300
Temperature range	[°C] ([°F])	-20 to +60 (-4 to +140)		-30 to +70 (-22 to +158)
Max. temperature	[°C] ([°F])	+90 (+194) (on conductor)		+ 90 (+ 194) (on conductor)
Min. bending radius	[mm] ([in])	100 (3.94)	95 (3.7)	45 (1.8)
Diameter D	[mm]	9.8 ± 0.2	9.5 ± 0.2	5.7 ± 0.2
Maximum acceleration	[m/s ²] ([ft/s ²])	20 (66)		10 (33)
Max. velocity	[m/min] ([ft/min])	200 (656)		50 (160)
Core identification		WH/BN, GN/YE, GY/PK, BU/RD, BK/VT, GY-PK/RD-BU	WH/BN, GN/YE, GY/PK, BU/RD, BK/VT	2 x WH with digit + 1 x GN/YE
Sheath color		Green similar to RAL 6018		Black RAL 9005
Approval(s)		DESINA / VDE /  US		VDE / UL
Capacitance core/shielding	[nF/km]	100		—
Capacitance core/core	[nF/km]	55		—
Halogen-free		Yes		Yes
Silicone-free		Yes		Yes
CFC-free		Yes		Yes
Inner insulation (core)		PP		TPM
Outer insulation (sheath)		TPE-U		TPE-U
Flame-inhibiting/ self-extinguishing		Yes		Yes
Conductor material		E-Cu blank		E-Cu blank
Shielding		Braided tinned Cu		—
Weight	[kg/km] ([lb/mi])	130 (461)	120 (426)	50 (177)
Min. bending cycles		≥ 5 million		



5.8 Assembling resolver/HIPERFACE® plug connectors

5.8.1 Scope of delivery for plug connectors

The following parts are supplied for assembling resolver/HIPERFACE® plug connectors. The SEW part number is 198 673 2.



54715AXX

- [1] Screw fitting
- [2] Seal with strain relief
- [3] Shield ring
- [4] Socket contacts
- [5] Insulating sleeve
- [6] Insulator
- [7] Connector housing



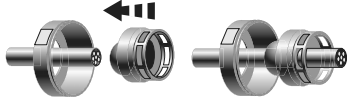
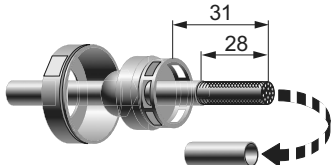
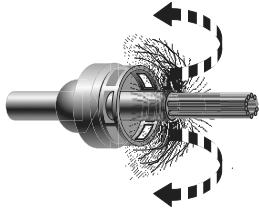
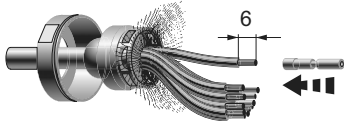
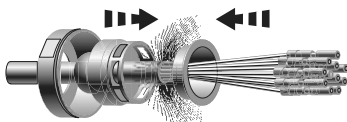
Hold the cable firmly in place when tightening the cable and the connector.



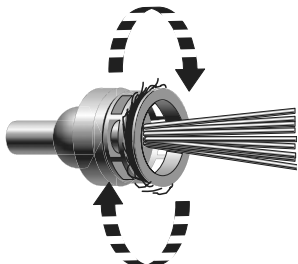
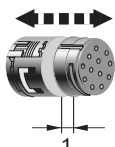
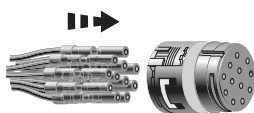
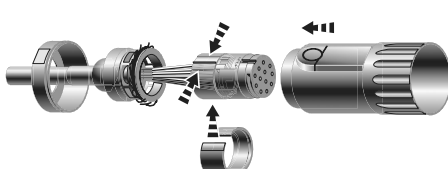
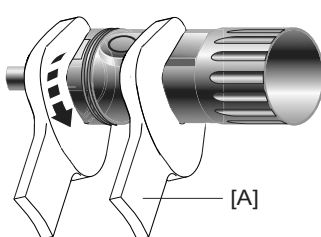
Electrical Installation

Assembling resolver/HIPERFACE® plug connectors

5.8.2 Assembly instructions for plug connectors

1		Pull the screw fitting and seal with strain relief 31 mm (1.2 in.) over the cable.
2		Strip 28 mm (1.1 in) of cable insulation off the end of the cable
3		Fold back the braided shield and fan it out
4		- Strip 6 mm (0.24 in) insulation off the leads - Push the socket contacts onto the ends of the leads
5		- Insert the small-diameter positioning tool (SEW part number 019 244 9) into the crimping tool until the green mark appears in the view window [A]. - Set the pressing force [B] to 24 on the crimping tool.
6		- Insert a lead with socket contact in the crimping tool and press the tool fully together. The tool then opens automatically. - Repeat this procedure for each lead.
7		Pull the shield ring over the leads and press the shield against the seal.



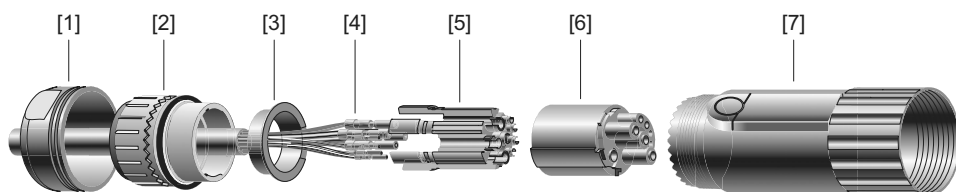
8		Turn the shield ring until the braided shield is flush with the shield ring.
9		Pull the insulator apart evenly by about 1 mm (0.04 in).
10		Insert the socket contacts into the insulator.
11		Press the insulator together until you hear a click.
12		- Fold open the insulating sleeve. - Position the side of the insulating sleeve with the recess against the groove in the insulator so that the opening of the insulating sleeve is pointing in the same direction as the double-headed arrow on the insulator. - Press the insulating sleeve together until it engages. - Insert the insulator into the connector housing in the middle position.
13		- Use a wrench to hold the connector housing in place and use a second wrench to tighten the screw fitting. [A] = Hold in place



5.9 Assembling the power connector

5.9.1 Scope of delivery for the power connector

The following parts are supplied for assembling the power connectors. The SEW part number is 198 674 0.

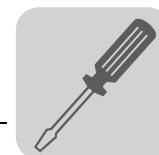


56252AXX

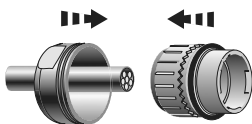
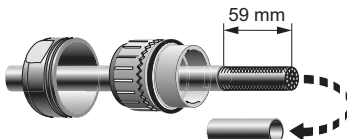
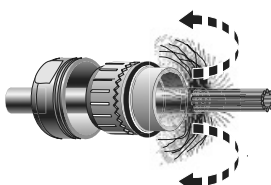
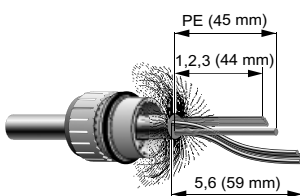
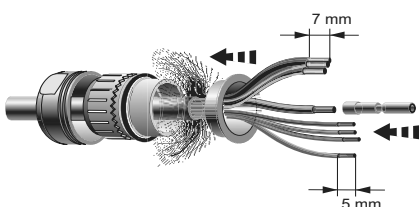
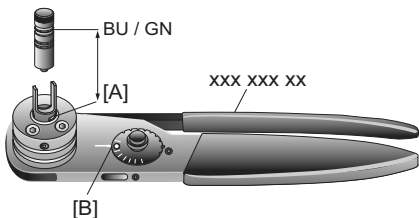
- [1] Screw fitting
- [2] Seal with strain relief
- [3] Shield ring
- [4] Socket contacts
- [5] Insulating sleeve
- [6] Insulator
- [7] Connector housing



Hold the cable firmly in place when tightening the cable and connector.



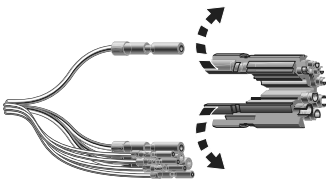
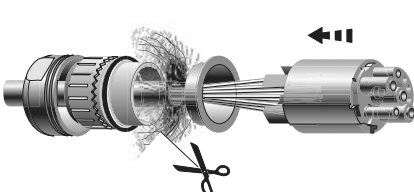
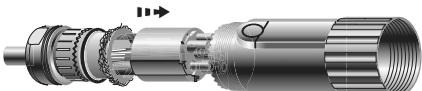
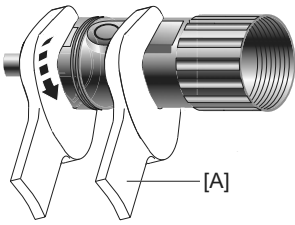
5.9.2 Assembly instructions for the power connector

1		Pull the screw fitting and the seal with strain relief over the cable.															
2		Strip 59 mm (2.3 in) of cable insulation off the end of the cable.															
3		Fold back the braided shield and fan it out.															
4		- Shorten the power leads (1, 2 and 3) to 44 mm (1.7 in). - Shorten the PE lead (GN/YE) to 45 mm (1.8 in). - Do not shorten lead pair 5 and 6. - Cut off lead pair 7 and 8 flush with the end of the cable.															
5		- Pull the shield over the leads. - Strip 7 mm (0.3 in) of insulation off leads 1, 2, 3 and PE. - Strip 5 mm (0.2 in) of insulation of leads 5 and 6.															
6		- Insert the positioning tool in the crimping tool until the marking (color) appears in the view window [A] appears (see table below). - Set the pressing force [B] on the crimping tool according to the table. <table><tr><th>Lead</th><th>a [mm²]</th><th>Positioning Part number xxx xxx x</th><th>Marking (color)</th><th>Press force</th></tr><tr><td>5 and 6</td><td>0.14 ... 1.0</td><td>019 244 9</td><td>Green (GN)</td><td>24</td></tr><tr><td>1, 2, 3 and PE</td><td>0.35 ... 4.0</td><td>019 245 7</td><td>Blue (BU)</td><td>6</td></tr></table>	Lead	a [mm ²]	Positioning Part number xxx xxx x	Marking (color)	Press force	5 and 6	0.14 ... 1.0	019 244 9	Green (GN)	24	1, 2, 3 and PE	0.35 ... 4.0	019 245 7	Blue (BU)	6
Lead	a [mm ²]	Positioning Part number xxx xxx x	Marking (color)	Press force													
5 and 6	0.14 ... 1.0	019 244 9	Green (GN)	24													
1, 2, 3 and PE	0.35 ... 4.0	019 245 7	Blue (BU)	6													
7		- Insert a lead with socket contact in the crimping tool and press the tool fully together. The tool then opens automatically. - Repeat this procedure for each lead in accordance with the table in step 6.															



Electrical Installation

Assembling the power connector

8		Open the insulating sleeve.
9		- Insert the middle socket contact into the insulator as shown in the wiring diagram in section 5.3. - Close the insulating sleeve until it clicks shut. - Insert the remaining socket contacts into the insulator as shown in the wiring diagram in section 5.3.
10		- Shorten the braid shield as shown. - Insert the shield ring into the seal so that the shield and end of the cable are flush. Make sure that the braided shield is routed cleanly between the shield ring and the seal.
11		Insert the insulator into the connector housing until the seal rests against its stop in the connector housing.
12		- Use a wrench to hold the connector housing in place and use a second wrench to tighten the screw fitting. [A] = Hold in place



5.10 Brake

The brake is released electrically. The brake is applied mechanically when the voltage is switched off.



The brake will not function if the polarity is incorrect. Make sure the polarity is correct.



Comply with the applicable regulations issued by the relevant employer's liability insurance association regarding phase failure protection and the associated cycle/cycle modifications.



If the brake is not controlled correctly, it closes (the closed brake no longer reaches the holding torque that is given).



In view of the DC voltage to be switched and the high level of current load, it is essential to use either special brake contactors or AC contactors with contacts in utilization category AC-3 according to EN 60947-4-1.

The mechanical brake is not used as service brake but as emergency brake or holding brake for general machine standstill.

Observe the notes in the relevant operating instructions for servo controllers concerning the switching sequence of motor enable and brake control during standard operation.

Motor size

The standard voltage supply of the brakes is 24 V DC and they operate with a constant braking torque. The brakes cannot be retrofitted and operate without brake rectifier or brake control unit. Observe the maximum currents of the brakes when connecting them (see table in Section 4.3). The overvoltage protection must be implemented by the customer, for example using varistors.

Speed classes

The brake can be used at all speeds.

The mechanical brake is not used as service brake but as emergency brake or holding brake for general machine standstill.

Observe the notes in the relevant operating instructions for servo controllers concerning the switching sequence of motor enable and brake control during standard operation.



5.11 Motor protection



Connect the supplied optional equipment according to the enclosed wiring diagrams. The wiring diagrams can also be found in Sec. "Appendix".

TF temperature sensor



Do not apply voltage

The positive temperature coefficient (PTC) temperature sensors comply with DIN 44082.

Resistance measurement (measuring instrument with $V \leq 2.5 \text{ V}$ or $I < 1 \text{ mA}$):

- Standard measured values: 20...500 Ω , thermal resistance $> 4000 \text{ } \Omega$

TH thermostat (bi-metallic switch)

The thermostats are connected in series and open when the permitted winding temperature is exceeded.

TH data	AC	DC	
Max. voltage	AC 60 V ¹⁾	DC 60 V	DC 24 V
Current ($\cos \varphi = 1.0$)	AC 2.5 A	DC 1.0 A	DC 1.6 A
Current ($\cos \varphi = 1.0$)	AC 1.6 A		

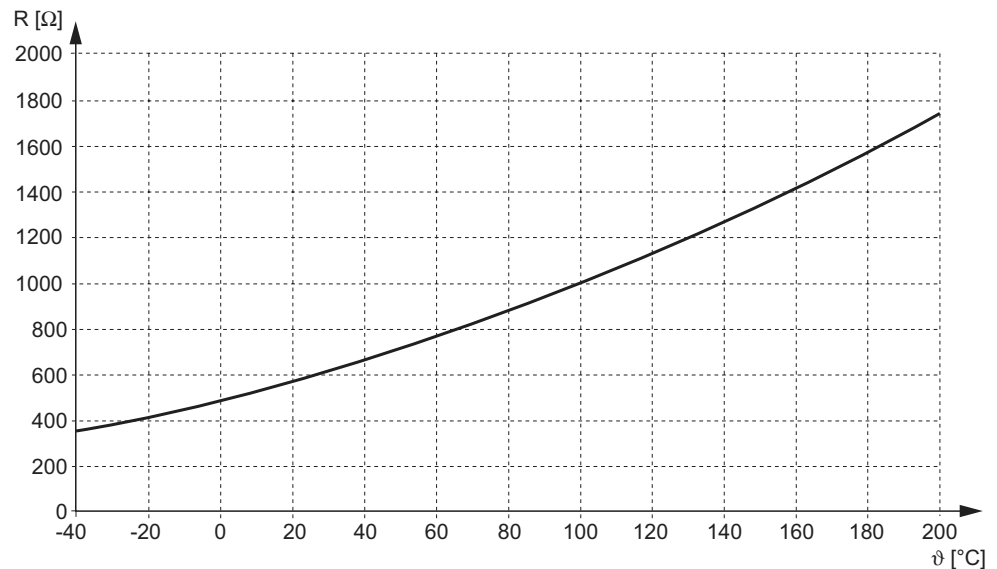
1) AC 250 V is permitted in the version with terminal boxes



KTY temperature sensor

- It is essential to observe the correct connection of the KTY to ensure correct evaluation of the temperature sensor.
- Avoid currents > 4 mA in the circuit of the KTY since high self-heating of the temperature sensor can damage its insulation and the motor winding.

The characteristic curve in the following figure shows the resistance curve with a measuring current of 2 mA.



50927AXX



Note the polarity.



6 Startup

6.1 Prerequisites for startup



- **Strictly observe the safety notes in the individual sections.**
- **The technical data specified in section 9 must be observed.**

Before startup

- The spindle must be secured against turning (→ Installing the CMS71L electric cylinder in the application); if it is not secured, the bellows will be destroyed.
- The drive must be undamaged and not blocked.
- The procedures stipulated in section "Preliminary work" must be performed after extended storage.
- All connections have to be made correctly.
- The direction of rotation of the electric cylinder must be correct. Note the spindle position and direction of rotation of the electric cylinder.
- All protective covers have to be fitted correctly.
- All motor protection devices have to be active.
- The brake must work perfectly in hoist applications.
- There must be no other sources of danger present.
- The motor must run correctly (no overload, no speed fluctuation, no loud noises, etc.).
- The braking torque must be set according to the specific application (→ section "Technical Data").
- In case of problems (→ sec. "Malfunctions")



Follow sec. 8.6 when using the lubricator option.



7 Malfunctions



- You must strictly adhere to the safety instructions in the individual sections.
- Components may be subject to mechanical loads. Before removing the electric cylinder, ensure that the structure provided by the customer is supported and secured.
- Before starting work, isolate the electric cylinder and brake from the power supply. Secure the electric cylinder against unintended power-up.
- Use only genuine spare parts in accordance with the applicable spare parts list.



Burns hazard

Touching the CMS electric cylinder when it has not been cooled can result in burns. The CMS electric cylinder can have a surface temperature of over 65 °C (149 °F).

To prevent burns:

- Never touch the CMS electric cylinder during operation or during the cool-down phase once it has been switched off.

7.1 Motor malfunctions

Malfunction	Possible cause	Remedy
Electric cylinder does not start	Break in supply cable	Check connections, correct if necessary
	Fuse has blown	Replace fuse
	Motor protection has triggered	Check motor protection for correct setting, correct error if necessary.
Incorrect direction of rotation	Electric cylinder connected incorrectly	Check servo inverter, check setpoints
Electric cylinder hums and has high current consumption	Drive is blocked	Check drive
	Brake does not release	→ Sec. "Brake problems"
	Fault on encoder cable	Check encoder cable
Electric cylinder heats up excessively (measure temperature)	Overload	Measure power, use larger motor or reduce load if necessary
	Insufficient cooling	Correct cooling air supply or clear cooling air passages, retrofit forced cooling fan if necessary
	Ambient temperature is too high	Comply with permitted temperature range
	Rated operation type (S1 to S10, DIN 57530) exceeded, e.g. through excessive startup frequency	Adjust rated operation type of motor to required operating conditions; if necessary, call in a specialist to determine correct drive
Running noise on motor	Bearing damage	Contact SEW-EURODRIVE customer service



Malfunctions

Malfunctions when operating with a servo inverter

7.2 Malfunctions when operating with a servo inverter



The symptoms described in "Motor malfunctions" may also occur when the motor is operated with a servo inverter. Refer to the servo inverter operating instructions for the meaning of the problems that occur and to find information about rectifying the problems.

7.3 Brake malfunctions

Malfunction	Possible cause	Remedy
Brake does not release	Incorrect operating voltage on the brake	• Apply correct voltage • Reversed polarity
	Max. permitted working air gap exceeded because brake lining worn down	Contact SEW-EURODRIVE customer service
	Voltage drop on supply cable > 10%	Provide for correct connection voltage; check cable cross section
	Brake coil has interturn fault or short circuit to exposed conductive part	Contact SEW-EURODRIVE customer service
Motor does not brake	Brake lining worn down	Contact SEW-EURODRIVE customer service
	Incorrect braking torque	Contact SEW-EURODRIVE customer service

7.4 Customer service

Please have the following information available if you require customer service assistance:

- Nameplate data (complete)
- Type and extent of the problem
- Time the problem occurred and any accompanying circumstances
- Assumed cause



8 Inspection and Maintenance



- Strictly observe the safety notes in the individual sections.
- Components may be subject to mechanical loads. Before removing the electric cylinder, ensure that the structure provided by the customer is supported and secured.
- Before starting work, isolate the electric cylinder and brake from the power supply. Secure the electric cylinder against unintended power-up.
- Use only genuine spare parts in accordance with the applicable spare parts list.



Burns hazard

Touching the CMS electric cylinder when it has not been cooled can result in burns. The CMS electric cylinder can have a surface temperature of over 65 °C (149 °F).

To prevent burns:

- Never touch the CMS electric cylinder during operation or during the cool-down phase once it has been switched off.

8.1 General maintenance work

The electric cylinder is maintenance-free except for the threaded spindles. Replace defective parts, if possible.

Remove any traces of dirt, chips, dust, etc. from the bellows (only CMS71L) with a soft cloth.

Note that mobile cables are subject to wear. They have to be checked for external changes on a regular basis.

8.2 Lubricating threaded spindles

There may be a loss of lubricant between the nut and spindle in threaded spindles. Lubricants also decrease in quality and effectiveness with age and wear. This means lubrication is required at regular intervals.

Lubrication for threaded spindles has to be specified accurately in terms of type, quantity and relubrication intervals. These factors are determined by:

- Load
- Speed
- Cyclic duration factor
- Type of threaded spindle (ball screw or planetary screw drive)
- Ambient temperature
- Degree of pollution caused by dust, humidity, etc.



The following information is intended as recommendations only. It is not intended to replace individual project planning for every application.



Inspection and Maintenance

Lubricating threaded spindles

Continuous relubrication (e.g. by connection to the lubrication system, see section 5.5) is generally preferable to relubrication at intervals.

Relubrication at intervals is especially not recommended for planetary roller screws, which can require about 2.5 times more lubricant than recirculating ball screws.

8.2.1 General

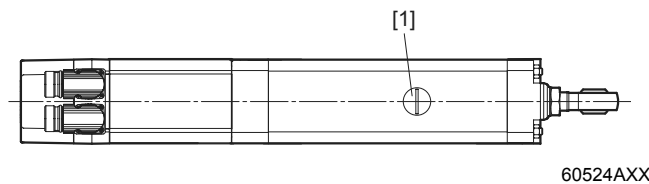


The lubricating grease discharged into the electric cylinder accumulates in the inside of the drive. Used lubricant must be removed from the inside of the motor after five years at the latest.

Service work must be performed by SEW employees only. During service work, the spindle must be removed from the unit and the old lubricant removed from the spindle's surface.

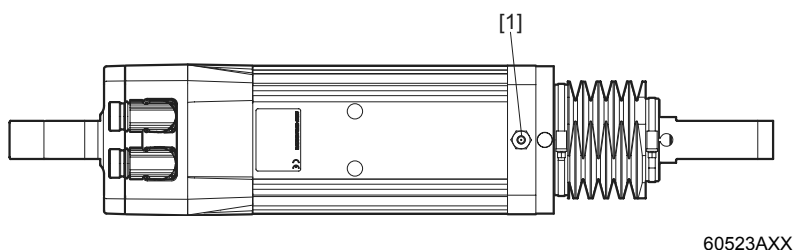
8.2.2 Size CMS50S

A taper greasing nipple DIN 71412 [1] for manual relubrication with a grease gun is installed as standard on the spindle nut in the inside of the motor. You can access the greasing nipple by way of screw plugs [1]; slowly move the drive until the lubricant position is visible (see section 4.4).



8.2.3 Size CMS71L/M

A taper greasing nipple DIN 71412 [1] for manual relubrication with a grease gun is installed as standard on the motor.





8.3 Lubricant for recirculating ball screws and planetary roller screws

CMS electric cylinders are filled with the lubricant Fuchs RENOLIT CX-TOM15 as standard at the plant, and are used for recirculating ball screws and planetary roller screws. The lubricant is suitable for a temperature range from $-20\text{ }^{\circ}\text{C}$ to $+40\text{ }^{\circ}\text{C}$ ($-4\text{ }^{\circ}\text{F}$ to $104\text{ }^{\circ}\text{F}$).



Only relubricate electric cylinders with the following lubricant:
Fuchs RENOLIT CX-TOM

8.4 Lubrication interval



- The drive must generally be relubricated once a year.
- The following information only applies to the application examples described.
- Always use the appropriate amount of lubricant for the individual application.
- If insufficient lubricant is applied, the lubricant film is disrupted and the service life thereby reduced.
- Excessive lubrication increases friction and results in heat generation.
- When relubricating the drive, always pay attention to cleanliness.
- There should be no dirt in the lubricant.
- Wipe the greasing nipple with a cloth before applying the grease gun.
- Make sure there is no trapped air in the lubricant or lubricant supply lines.

8.4.1 CMS50S with ball screw (KGT):

Relubrication

Relubrication quantity 1 cm^3

- After a travel distance of 200 km (124.27 miles)
- or
- 40 million revolutions of the threaded spindle nut

Example

CMS50S, 5 mm (0.2 in)/spindle pitch revolution

- 0.15 m (0.49 ft) travel distance
- Average traveling speed 0.15 m/s (0.49 ft/s)
- 1300 N (292.3 lbf) load



8.4.2 CMS71L with ball screw (KGT):

Relubrication intervals	Relubrication quantity 2 cm^3 • after a travel distance of 250 km (155 miles) or • 25 million revolutions of the threaded spindle nut
--------------------------------	---

Example	CMS71L, 10 mm (0.39 in)/spindle pitch revolution • 0.2 m (0.66 ft) travel distance • Average traveling velocity 0.2 m/s (0.66 ft/s) • 4000 N (899.2 lbf) load
----------------	---

Continuous relubrication	$0.8 \text{ cm}^3/100 \text{ km} = 0.008 \text{ cm}^3/1 \text{ km}$
---------------------------------	---

8.4.3 CMS71L with planetary roller screw drive (PGT):

Relubrication interval (not recommended)	Relubrication quantity 2.5 cm^3 • After a travel distance of 50 km (31 miles) or • 10 million revolutions of the threaded spindle
---	---

Example	CMS71L, 5 mm (0.2 in)/spindle pitch revolution • 0.2 m (0.66 ft) travel distance • Average traveling velocity 0.2 m/s (0.66 ft/s) • 4000 N (899.2 lbf) load
----------------	---

Continuous relubrication	$2 \text{ cm}^3/100 \text{ km} = 0.02 \text{ cm}^3/1 \text{ km}$
---------------------------------	--

8.4.4 CMS71M with planetary roller screw (PGT) in welding tong version

Relubrication intervals	Relubrication quantity 6 cm^3 • After 1.2 million welding spots
--------------------------------	---

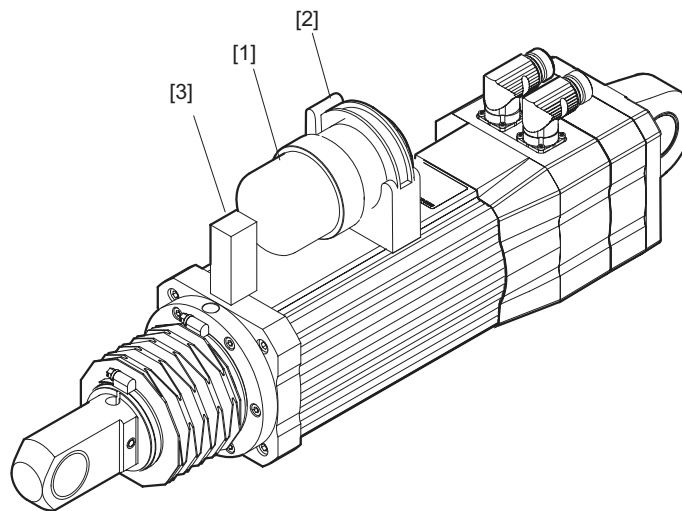


8.5 Lubricator – only for size CMS71

The electric cylinder size CMS71 can be equipped with a lubricator upon request. The threaded spindle nut is relubricated continuously with this option.

The lubricator comprises a drive unit with an electric motor, which is supplied with power either with a set of batteries (Vario lubrication system) or with 24 V and function monitoring (Control lubrication system). This motor is drained via a piston rod on the lubricator [1].

The threaded elbow joints [3] are mounted, filled with lubricant and vented at the production plant.



62019AXX

- [1] Lubricator
- [2] Retaining clip
- [3] Threaded elbow joint



The time between lubrications is set to one year at the production plant and is sufficient for normal applications.

For cases with high annual operating time, e.g. 24 operating hours per day, consult SEW-EURODRIVE.



Inspection and Maintenance

Lubricator – only for size CMS71

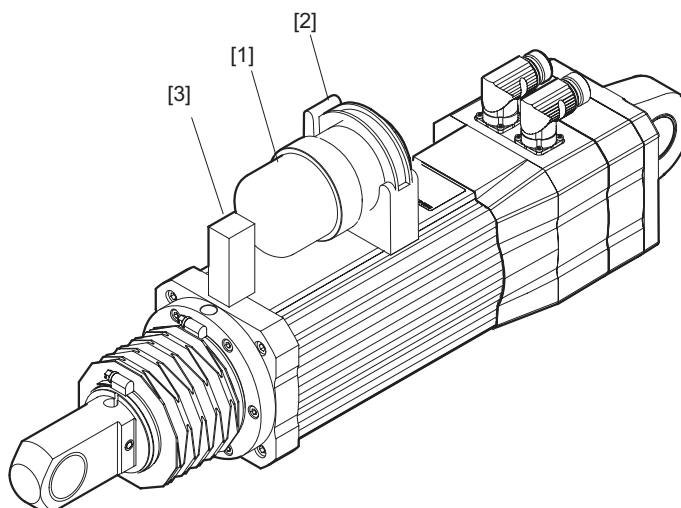
***Wearing parts
can be ordered
from Perma***

The lubricator [1] and the battery set (only for Vario) are wearing parts and must be replaced after one year.

The parts can be ordered directly from Perma using the following part numbers:

Designation	Part no.:
Lubricator Star LC unit S60 Renolit CX-TOM15	16.01085.385
Battery set	21.000.000

These parts cannot be ordered directly from SEW-EURODRIVE.



62019AXX

***Retrofit
set from
SEW-EURODRIVE***

Cpl. lubrication systems can be ordered from SEW-EURODRIVE. The retrofit set consists of parts [1, 2] with the following part numbers:

Designation	Part no.:
Retrofit set lubricator cpl. Vario	1333 281 3
Retrofit set lubricator cpl. Control	1333 319 4

The following threaded elbow joint 1333178 [3] must also be ordered from SEW-EURODRIVE, as it **is not included in the retrofit set**.



When retrofitting, you must vent the threaded elbow joint [3] (see sec. 8.6.3).



8.6 Assembly and startup of the Star Vario / Star Control lubricator

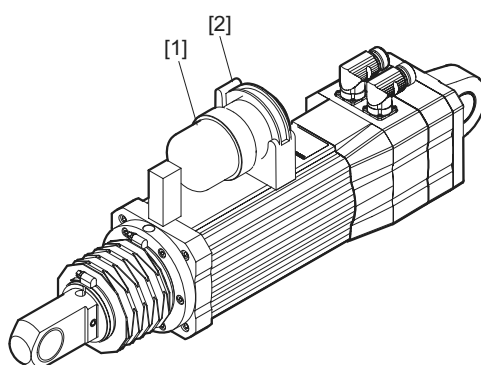
8.6.1 Assembly kit for lubricator

Assembly kit for lubricator

- Star Vario cpl. SEW part number 13332813
- Star Control cpl. SEW part number 13333194

consists of the following individual components:

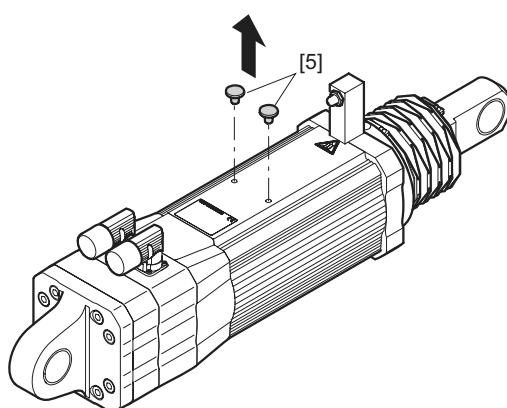
- 1 x Star Vario lubricator
- or Star Control lubricator [1]
- 1 x clamp [2]
- 2 x machine screw M6x16



62020AXX

8.6.2 Assembly procedure

1. Remove the closing plug [5] from the motor housing.



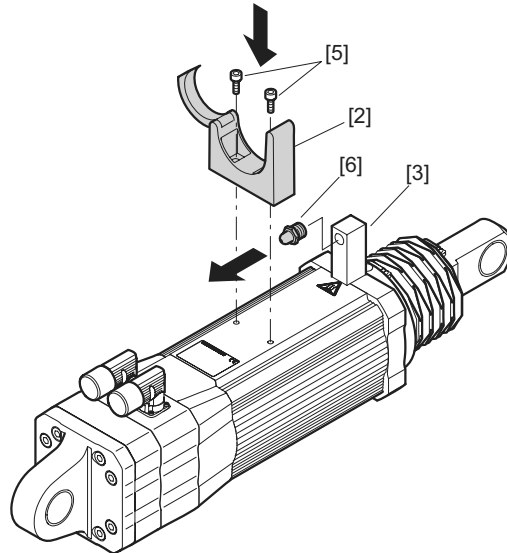
61958AXX



Inspection and Maintenance

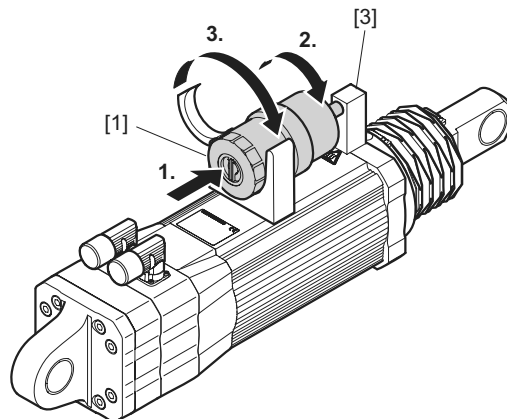
Assembly and startup of the Star Vario / Star Control lubricator

2. Secure the clamp [2] on the motor housing using the machine screw [5] and the M6 threads. Remove the greasing nipple [6] from the attached threaded elbow joint [3] and remove the closing plug from the lubricator.



61959AXX

3. Place the lubricator [1] into the clamp and twist the lubricator into the threaded elbow joint [3]. Tighten the lubricator manually.



61960AXX

4. Close the clamp by locking the top clamp arm into place.
5. For the Star Control version, connect the cable to the output terminal of the PLC control.



8.6.3 Retrofitting the lubricator

This requires the threaded elbow joint [3], see fig. 8.5 (SEW part number: 13333178).

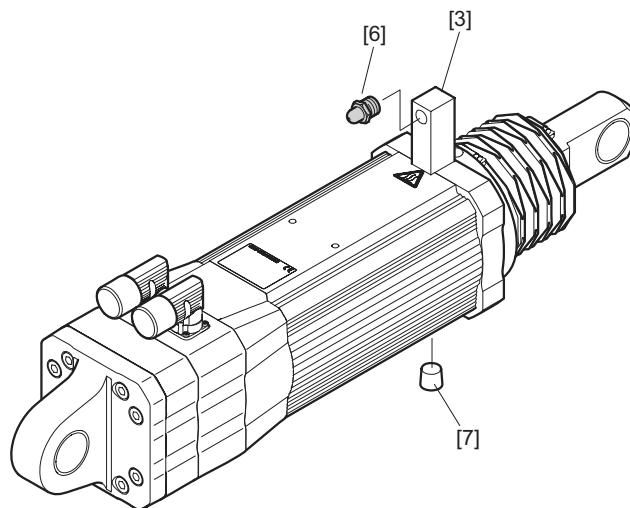


The threaded elbow joint is not included in the assembly kit and must be ordered from SEW-EURODRIVE separately.

Trapped air in the lubrication system



Air trapped in the lubrication system could lead to an inadequate supply of lubricant to the spindles. The system must be vented according to the steps described below.



61961AXX

1. Mount the threaded elbow angle [3], tighten it manually and insert the greasing nipple [6].
2. Release the screw plug [7] and remove it.
3. Press enough grease into the threaded elbow joint [3] until the grease escaping from the screw plug bore [7] has no bubbles.
4. Turn the screw plug [7] back in and tighten it.
5. For other assembly procedures, see the assembly procedure in section 8.6.2.



Inspection and Maintenance

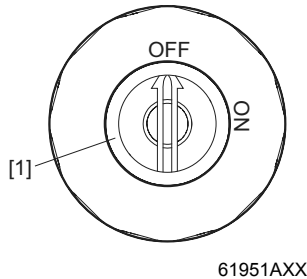
Assembly and startup of the Star Vario / Star Control lubricator

8.6.4 Lubricator startup

Star Vario

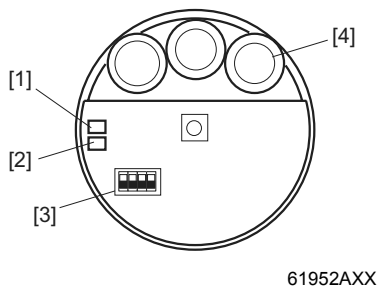
The code switches of the Star Vario version are factory set to a dispensing time of 12 months or a dispensing volume of 60 cm³, which is sufficient for standard applications.

When the electric cylinder is started up, the Star Vario lubricator must be activated. Activate the lubricator by turning the rotary switch to the **ON** position.



[1] Rotary switch

Status display



- [1] Red LED
- [2] Green LED
- [3] 4-way code switch
- [5] Battery

LED	Signal	Signal intervals	Operating status
Green	Flashing	Every 15 seconds	Operation (OK)
Red	Flashing	Every 8 seconds	Fault / Malfunction
Green and red	Flashing	Every 3 seconds	LC unit empty
Red	Flashing	Constant	Vario dispensing

	12 months (SEW factory setting)	6 months	3 months	1 month
Runtime setting coding				
Daily dispensing volume	0.17 cm ³	0.33 cm ³	0.67 cm ³	2.0 cm ³

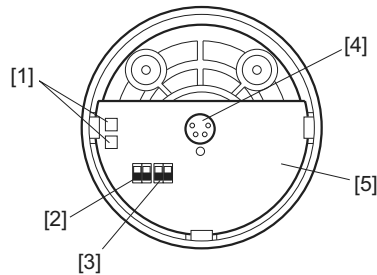


Star Control

The code switches of the Star Vario version are set to a dispensing quantity of 0.69 cm³ for every 100 operating hours or a dispensing volume of 60 cm³.

The Star Control version is connected to the voltage supply and evaluation unit directly. In motor operation, the lubricator is controlled by them. This means that manual activation is not necessary.

Status display

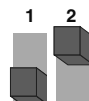


61953AXX

- [1] Function display
- [2] "Time" elevated switch
- [3] "VOL" lowered switch
- [4] Plug connection
- [5] Circuit board

LED	Signal	Description
Green	Constant signal	OK = System functioning
Red	Constant signal < 30 sec. with motor start-up	Dispensing action
Red	Constant signal > 30 sec.	Fault / Malfunction
Green and red	Constant signal	LC unit empty, replace

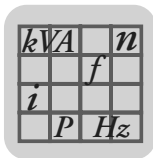
"VOL" lowered switch



The lowered "VOL" switches must always be in this position.

Elevated "TIME" switches (to adjust the relubrication quantity):

	(SEW factory setting)			
Runtime setting coding				
Dispensing quantity for every 100 operating hours	0.69 cm ³	1.39 cm ³	2.78 cm ³	8.33 cm ³



Technical Data

Technical data of the CMS50S electric cylinder

9 Technical Data

9.1 Technical data of the CMS50S electric cylinder

9.1.1 Electrical data



Maximum mechanical speed is 4500 rpm

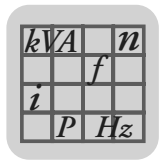
Rated speed n_{rated}			3000 rpm	4500 rpm
Static torque	M_0	[Nm] ([in-lb])	1.3 (11)	1.3 (11)
Standstill current	I_0	[A]	0.96	1.32
Max. torque	M_{DYN}	[Nm] ([in-lb])	5.2 (45)	5.2 (45)
Max. current	I_{max}	[A]	5.1	7.0
Mass moment of inertia without brake ¹⁾	J_{mot}	[10 ⁻⁴ kgm ²]	0.56	0.56
Mass moment of inertia with brake ¹⁾	J_{motB}	[10 ⁻⁴ kgm ²]	0.62	0.62
Mass moment of inertia with spindle	$J_{Spindle}$	[10 ⁻⁴ kgm ²]	0.147	0.147
Braking torque	M_B	[Nm] ([in-lb])	4.3 (37)	4.3 (37)
Inductance	L_1	[mH]	71	37
Ohmic resistance	R_1	[m]	22.49	11.6
Rotor voltage	V_{p0}	[V/1000 rpm]	86	62

1) for the complete motor and spindle

9.1.2 Mechanical data

Rated speed n_{rated}			3000 rpm	4500 rpm
Spindle pitch	P	[mm] ([in])	5 (0.2)	5 (0.2)
Spindle diameter	D	[mm] ([in])	16 (0.63)	16 (0.63)
Maximum permanent feed thrust	F	[N] ([lbf])	1300 (292.3)	1300 (292.3)
Peak feed force ¹⁾	F_{max}	[N] ([lbf])	5300 (1191)	5300 (1191)
Rated stroke		[mm]	70 / 150 (300)	70 / 150 (300)
Weight, version without brake	m	[kg] ([lb])	6.5 (14)	6.5 (14)
Weight, version with brake	m_B	[kg] ([lb])	7.1 (16)	7.1 (16)

1) Depends on max. amplifier current, dyn. or stat. load of spindle; contact SEW-EURODRIVE prior to project planning with maximum force.



9.2 Technical data of the CMS71L electric cylinder

9.2.1 Electrical data



Maximum mechanical speed is 3000 rpm

Rated speed n_{rated}			2000 rpm	3000 rpm	4500 rpm
Static torque	M_0	[Nm] ([in-lb])	9.5 (82)	9.5 (82)	9.5 (82)
Standstill current	I_0	[A]	4.2	6.2	9.6
Max. torque	M_{DYN}	[Nm] ([in-lb])	31.4 (272)	31.4 (272)	31.4 (272)
Max. current	I_{max}	[A]	16.8	25	38
Mass moment of inertia without brake ¹⁾	J_{mot}	[10 ⁻⁴ kgm ²]	32.5	32.5	32.5
Mass moment of inertia with brake ¹⁾	J_{mot}	[10 ⁻⁴ kgm ²]	37.5	37.5	37.5
Mass moment of inertia with spindle	$J_{Spindle}$	[10 ⁻⁴ kgm ²]	27	27	27
Braking torque	M_B	[Nm] ([in-lb])	19 (160)	19 (160)	19 (160)
Inductance	L_1	[mH]	24	11	4.9
Ohmic resistance	R_1	[m]	2500	1120	446
Rotor voltage	V_{p0}	[V/1000 rpm]	152	102	65

1) for the complete motor and spindle

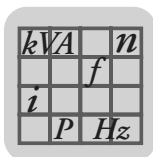
9.2.2 Mechanical data

Spindle type		KGT	KGT	PGT
Spindle pitch [mm]	P	10	6	5
Spindle diameter [mm]	D	32	32	24
Maximum permanent feed thrust ¹⁾ [N] ([lbf])	F	4000 (899)	6700 (1506)	8000 (1798)
Peak feed thrust ²⁾ [N] ([lbf])	F_{max}	17000 (3821.8)	20000(4496.2) ³⁾	20000 (4496.2)
Rated stroke [mm]		200	350	200
Weight, version without brake [kg] ([lb])	m	16 (35)	23.5 (51.8)	16 (32)
Weight, version with brake [kg] ([lb])	m_B	17 (37)	24.5 (54.0)	17 (37)

1) at a speed of 5 to 50 rpm

2) Depends on max. amplifier current, dyn. or stat. load of spindle; prior to project planning with maximum force please contact SEW-EURODRIVE.

3) only tension



Technical Data

Technical data of the CMS71M electric cylinder

9.3 Technical data of the CMS71M electric cylinder

9.3.1 Electrical data



Maximum mechanical speed is 3600 rpm

Rated speed n_{rated}			3000 rpm
Static torque	M_0	[Nm] ([in-lb])	6.5 (56)
Standstill current	I_0	[A]	4.3
Max. torque	M_{DYN}	[Nm] ([in-lb])	21.5 (108)
Max. current	I_{max}	[A]	17.2
Mass moment of inertia without brake ¹⁾	J_{mot}	[10 ⁻⁴ kgm ²]	28.4
Mass moment of inertia with brake ¹⁾	J_{mot}	[10 ⁻⁴ kgm ²]	28.8
Mass moment of inertia with spindle	$J_{Spindle}$	[10 ⁻⁴ kgm ²]	23
Braking torque	M_B	[Nm] ([in-lb])	1.2 (10)
Inductance	L_1	[mH]	16
Ohmic resistance	R_1	[m]	2000
Rotor voltage	V_{p0}	[V/1000 rpm]	100

1) for the complete motor and spindle

9.3.2 Mechanical data

Spindle type		PGT
Spindle pitch [mm]	P	5
Spindle diameter [mm]	D	24
Maximum permanent feed thrust ¹⁾ [N] ([lbf])	F	5300 (1191)
Peak feed thrust ²⁾ [N] ([lbf])	F_{max}	20000 (4496.2)
Rated stroke [mm]		155
Weight, version without brake [kg] ([lb])	m	15.1 (33.3)
Weight, version with brake [kg] ([lb])	m_B	15.3 (33.7)

1) At a speed of 5 to 50 rpm

2) Depends on max. amplifier current, dyn. or stat. load of spindle; contact SEW-EURODRIVE prior to project planning with maximum force.

9.4 Brake

Brake type	CMS50S	CMS71L	CMS71M
Maximum braking torque	4.3 Nm (38 in-lb)	19 Nm (168 in-lb)	1.2 Nm (11 in-lb)
Max. current	420 mA	800 mA	330 mA

10 Declaration of Conformity

EG-Konformitätserklärung

EC Declaration of Conformity
Déclaration de conformité CE



Nr./No/N° 900100007

SEW EURODRIVE GmbH & Co KG
Ernst-Blickle-Straße 42, D-76646 Bruchsal

erklärt in alleiniger Verantwortung die Konformität der folgenden Produkte
declares under sole responsibility conformity of the following products
déclare, sous sa seule responsabilité, la conformité des produits mentionnés ci-après

Elektrozylinder der Baureihe:
Spindle drive motors of the series:
Vérins électriques des séries:

CMS

mit der
with the / respectant la

Niederspannungsrichtlinie:
Low Voltage Directive / Directive Basse Tension:

2006/95/EG
2006/95 EC / 2006/95 CE

angewandte harmonisierte Normen:
applied harmonized standards / Normes harmonisées appliquées

EN 60034-1:2004

EN 60664-1:2003

Ort/Datum
Place/date / Lieu et date

Bruchsal, 24.01.2007

Geschäftsführer Vertrieb und Marketing
Managing Director Sales and Marketing
Directeur général international commercial et marketing

H. Sondermann



11 Index

A

Assembling plug connector	59
Assembling the power connector	62
Assembly instructions for plug connectors	60

B

Brake	65
-------------	----

C

Cable	38
Cable specification	50
Connector installation	34
Customer service	70

D

Design	8, 10
Design versions	8

E

Electrical characteristics	14
Electrical data CMS50S	82
Electrical data CMS71L	83, 84
EMC measures	36

F

Feedback cable	43
Flange mounting	22

I

Important notes	4
Inspection	71
Installation	19, 20
Installation notes CMS50S	26
Installation notes CMS71L	29
Installation on site	20
Installation on site, customer-provided	26
Installation, electrical	34

K

KGT	17
-----------	----

L

Lubricant	73
Lubricating threaded spindles	71
Lubricator	75
Lubricator, retrofitting	79
Lubricator, startup	80

M

Maintenance	71
Malfunctions	69
Mating connector combination	49

Mechanical characteristics	14
Motor design	8
Motor protection	66
Mounting dimensions for CMS50S	21
Mounting dimensions for CMS71L	24
Mounting position, horizontal	31
Mounting tolerances for CMS71L	32

N

Nameplate	13
-----------------	----

O

Operating environment	6
Operating principle	9

P

PGT	17
Pivot bearing mounting	23
Planetary roller screw drive	17
Plug connector	
<i>Assembly</i>	59
<i>Assembly instructions</i>	60
<i>Scope of delivery</i>	59
Power cable	38
Power connector	
<i>Assembly</i>	62
Preliminary work	19

R

Recirculating ball screw	17
--------------------------------	----

S

Safety function	6
Safety notes	6
Scope of delivery for plug connectors	59
Sealing air	18
Specification, cable	50
Startup	68

T

Technical data	82
<i>Brake</i>	84
Tolerances for mounting by customer	
<i>CMS50S</i>	31
<i>CMS71L</i>	32

U

Unit designation	12
------------------------	----

W

Wiring notes	36
--------------------	----



Address List

Germany			
Headquarters Production Sales	Bruchsal	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal P.O. Box Postfach 3023 • D-76642 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de
Service Competence Center	Central Gear units / Motors	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 D-76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 sc-mitte-gm@sew-eurodrive.de
	Central Electronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 sc-mitte-e@sew-eurodrive.de
	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 40-42 D-30823 Garbsen (near Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 sc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg 1 D-08393 Meerane (near Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-30 sc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 D-85551 Kirchheim (near München)	Tel. +49 89 909552-10 Fax +49 89 909552-50 sc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 D-40764 Langenfeld (near Düsseldorf)	Tel. +49 2173 8507-30 Fax +49 2173 8507-55 sc-west@sew-eurodrive.de
	Drive Service Hotline / 24 Hour Service		+49 180 5 SEWHELP +49 180 5 7394357
	Additional addresses for service in Germany provided on request!		
France			
Production Sales Service	Hagenau	SEW-USOCOME 48-54, route de Soufflenheim B. P. 20185 F-67506 Hagenau Cedex	Tel. +33 3 88 73 67 00 Fax +33 3 88 73 66 00 http://www.usocom.com sew@usocom.com
Assembly Sales Service	Bordeaux	SEW-USOCOME Parc d'activités de Magellan 62, avenue de Magellan - B. P. 182 F-33607 Pessac Cedex	Tel. +33 5 57 26 39 00 Fax +33 5 57 26 39 09
	Lyon	SEW-USOCOME Parc d'Affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 00 Fax +33 4 72 15 37 15
	Paris	SEW-USOCOME Zone industrielle 2, rue Denis Papin F-77390 Verneuil l'Etang	Tel. +33 1 64 42 40 80 Fax +33 1 64 42 40 88
Additional addresses for service in France provided on request!			
Algeria			
Sales	Alger	Réducom 16, rue des Frères Zagnoun Bellevue El-Harrach 16200 Alger	Tel. +213 21 8222-84 Fax +213 21 8222-84
Argentina			
Assembly Sales Service	Buenos Aires	SEW EURODRIVE ARGENTINA S.A. Centro Industrial Garin, Lote 35 Ruta Panamericana Km 37,5 1619 Garin	Tel. +54 3327 4572-84 Fax +54 3327 4572-21 sewar@sew-eurodrive.com.ar



Address List

Australia			
Assembly Sales Service	Melbourne	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. +61 3 9933-1000 Fax +61 3 9933-1003 http://www.sew-eurodrive.com.au enquires@sew-eurodrive.com.au
	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au
	Townsville	SEW-EURODRIVE PTY. LTD. 12 Leyland Street Garbutt, QLD 4814	Tel. +61 7 4779 4333 Fax +61 7 4779 5333 enquires@sew-eurodrive.com.au
Austria			
Assembly Sales Service	Wien	SEW-EURODRIVE Ges.m.b.H. Richard-Strauss-Strasse 24 A-1230 Wien	Tel. +43 1 617 55 00-0 Fax +43 1 617 55 00-30 http://sew-eurodrive.at sew@sew-eurodrive.at
Belgium			
Assembly Sales Service	Brüssel	SEW Caron-Vector S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. +32 10 231-311 Fax +32 10 231-336 http://www.caron-vector.be info@caron-vector.be
Brazil			
Production Sales Service	Sao Paulo	SEW-EURODRIVE Brasil Ltda. Avenida Amâncio Gaiolli, 50 Caixa Postal: 201-07111-970 Guarulhos/SP - Cep.: 07251-250	Tel. +55 11 6489-9133 Fax +55 11 6480-3328 http://www.sew.com.br sew@sew.com.br
	Additional addresses for service in Brazil provided on request!		
Bulgaria			
Sales	Sofia	BEVER-DRIVE GmbH Bogdanovetz Str.1 BG-1606 Sofia	Tel. +359 2 9151160 Fax +359 2 9151166 bever@fastbg.net
Cameroon			
Sales	Douala	Electro-Services Rue Drouot Akwa B.P. 2024 Douala	Tel. +237 4322-99 Fax +237 4277-03
Canada			
Assembly Sales Service	Toronto	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive Bramalea, Ontario L6T3W1	Tel. +1 905 791-1553 Fax +1 905 791-2999 http://www.sew-eurodrive.ca l.reynolds@sew-eurodrive.ca
	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. 7188 Honeyman Street Delta, B.C. V4G 1 E2	Tel. +1 604 946-5535 Fax +1 604 946-2513 b.wake@sew-eurodrive.ca
	Montreal	SEW-EURODRIVE CO. OF CANADA LTD. 2555 Rue Leger Street LaSalle, Quebec H8N 2V9	Tel. +1 514 367-1124 Fax +1 514 367-3677 a.peluso@sew-eurodrive.ca
Additional addresses for service in Canada provided on request!			
Chile			
Assembly Sales Service	Santiago de Chile	SEW-EURODRIVE CHILE LTDA. Las Encinas 1295 Parque Industrial Valle Grande LAMP RCH-Santiago de Chile P.O. Box Casilla 23 Correo Quilicura - Santiago - Chile	Tel. +56 2 75770-00 Fax +56 2 75770-01 www.sew-eurodrive.cl ventas@sew-eurodrive.cl



China			
Production Assembly Sales Service	Tianjin	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 46, 7th Avenue, TEDA Tianjin 300457	Tel. +86 22 25322612 Fax +86 22 25322611 gm-tianjin@sew-eurodrive.cn http://www.sew-eurodrive.com.cn
Assembly Sales Service	Suzhou	SEW-EURODRIVE (Suzhou) Co., Ltd. 333, Suhong Middle Road Suzhou Industrial Park Jiangsu Province, 215021 P. R. China	Tel. +86 512 62581781 Fax +86 512 62581783 suzhou@sew.com.cn
Additional addresses for service in China provided on request!			
Colombia			
Assembly Sales Service	Bogotá	SEW-EURODRIVE COLOMBIA LTDA. Calle 22 No. 132-60 Bodega 6, Manzana B Santafé de Bogotá	Tel. +57 1 54750-50 Fax +57 1 54750-44 http://www.sew-eurodrive.com.co sewcol@sew-eurodrive.com.co
Croatia			
Sales Service	Zagreb	KOMPEKS d. o. o. PIT Erdödy 4 II HR 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@net.hr
Czech Republic			
Sales	Praha	SEW-EURODRIVE CZ S.R.O. Business Centrum Praha Lužná 591 CZ-16000 Praha 6 - Vokovice	Tel. +420 220121234 Fax +420 220121237 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz
Denmark			
Assembly Sales Service	Kopenhagen	SEW-EURODRIVEA/S Geminivej 28-30, P.O. Box 100 DK-2670 Greve	Tel. +45 43 9585-00 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk
Estonia			
Sales	Tallin	ALAS-KUUL AS Mustamäe tee 24 EE-10620 Tallin	Tel. +372 6593230 Fax +372 6593231 veiko.soots@alas-kuul.ee
Finland			
Assembly Sales Service	Lahti	SEW-EURODRIVE OY Vesimäentie 4 FIN-15860 Hollola 2	Tel. +358 201 589-300 Fax +358 3 780-6211 sew@sew.fi http://www.sew-eurodrive.fi
Gabon			
Sales	Libreville	Electro-Services B.P. 1889 Libreville	Tel. +241 7340-11 Fax +241 7340-12
Great Britain			
Assembly Sales Service	Normanton	SEW-EURODRIVE Ltd. Beckbridge Industrial Estate P.O. Box No.1 GB-Normanton, West- Yorkshire WF6 1QR	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk
Greece			
Sales Service	Athen	Christ. Boznos & Son S.A. 12, Mavromichali Street P.O. Box 80136, GR-18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr



Address List

Hong Kong			
Assembly Sales Service	Hong Kong	SEW-EURODRIVE LTD. Unit No. 801-806, 8th Floor Hong Leong Industrial Complex No. 4, Wang Kwong Road Kowloon, Hong Kong	Tel. +852 2 7960477 + 79604654 Fax +852 2 7959129 sew@sewhk.com
Hungary			
Sales Service	Budapest	SEW-EURODRIVE Kft. H-1037 Budapest Kunigunda u. 18	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 office@sew-eurodrive.hu
India			
Assembly Sales Service	Baroda	SEW-EURODRIVE India Pvt. Ltd. Plot No. 4, Gidc Por Ramangamdi • Baroda - 391 243 Gujarat	Tel. +91 265 2831086 Fax +91 265 2831087 http://www.seweurodriveindia.com mdoffice@seweurodriveindia.com
Technical Offices	Bangalore	SEW-EURODRIVE India Private Limited 308, Prestige Centre Point 7, Edward Road Bangalore	Tel. +91 80 22266565 Fax +91 80 22266569 salesbang@seweurodriveinindia.com
Ireland			
Sales Service	Dublin	Alpert Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458
Israel			
Sales	Tel-Aviv	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 lirazhandasa@barak-online.net
Italy			
Assembly Sales Service	Milano	SEW-EURODRIVE di R. Blicke & Co.s.a.s. Via Bernini, 14 I-20020 Solaro (Milano)	Tel. +39 02 96 9801 Fax +39 02 96 799781 http://www.sew-eurodrive.it sewit@sew-eurodrive.it
Ivory Coast			
Sales	Abidjan	SICA Ste industrielle et commerciale pour l'Afrique 165, Bld de Marseille B.P. 2323, Abidjan 08	Tel. +225 2579-44 Fax +225 2584-36
Japan			
Assembly Sales Service	Iwata	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373814 sewjapan@sew-eurodrive.co.jp
Korea			
Assembly Sales Service	Ansan-City	SEW-EURODRIVE KOREA CO., LTD. B 601-4, Banweol Industrial Estate Unit 1048-4, Shingil-Dong Ansan 425-120	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-korea.co.kr master@sew-korea.co.kr
Latvia			
Sales	Riga	SIA Alas-Kuul Katlakalna 11C LV-1073 Riga	Tel. +371 7139253 Fax +371 7139386 http://www.alas-kuul.com info@alas-kuul.com



Lebanon			
Sales	Beirut	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 4947-86 +961 1 4982-72 +961 3 2745-39 Fax +961 1 4949-71 gacar@beirut.com
Lithuania			
Sales	Alytus	UAB Irseva Naujoji 19 LT-62175 Alytus	Tel. +370 315 79204 Fax +370 315 56175 info@irseva.lt http://www.sew-eurodrive.lt
Luxembourg			
Assembly Sales Service	Brüssel	CARON-VECTOR S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. +32 10 231-311 Fax +32 10 231-336 http://www.caron-vector.be info@caron-vector.be
Malaysia			
Assembly Sales Service	Johore	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 sales@sew-eurodrive.com.my
Mexico			
Assembly Sales Service	Queretaro	SEW-EURODRIVE MEXIKO SA DE CV SEM-981118-M93 Tequisquiapan No. 102 Parque Industriail Queretaro C.P. 76220 Queretaro, Mexico	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx
Morocco			
Sales	Casablanca	Afit 5, rue Emir Abdelkader MA 20300 Casablanca	Tel. +212 22618372 Fax +212 22618351 richard.miekisiak@premium.net.ma
Netherlands			
Assembly Sales Service	Rotterdam	VECTOR Aandrijftechniek B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085 NL-3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 http://www.vector.nu info@vector.nu
New Zealand			
Assembly Sales Service	Auckland	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 10 Settlers Crescent, Ferryroad Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz
Norway			
Assembly Sales Service	Moss	SEW-EURODRIVE A/S Solgaard skog 71 N-1599 Moss	Tel. +47 69 241-020 Fax +47 69 241-040 http://www.sew-eurodrive.no sew@sew-eurodrive.no
Peru			
Assembly Sales Service	Lima	SEW DEL PERU MOTORES REDUCTORES S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe



Address List

Poland			
Assembly Sales Service	Lodz	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 PL-92-518 Lodz	Tel. +48 42 67710-90 Fax +48 42 67710-99 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl
Portugal			
Assembly Sales Service	Coimbra	SEW-EURODRIVE, LDA. Apartado 15 P-3050-901 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt
Romania			
Sales Service	Bucuresti	Sialco Trading SRL str. Madrid nr.4 011785 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro
Russia			
Assembly Sales Service	St. Petersburg	ZAO SEW-EURODRIVE P.O. Box 36 195220 St. Petersburg Russia	Tel. +7 812 3332522 +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru
Senegal			
Sales	Dakar	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 849 47-70 Fax +221 849 47-71 senemeca@sentoo.sn
Serbia and Montenegro			
Sales	Beograd	DIPAR d.o.o. Ustanicka 128a PC Košum, IV floor SCG-11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 dipar@yubc.net
Singapore			
Assembly Sales Service	Singapore	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com
Slovakia			
Sales	Bratislava	SEW-Eurodrive SK s.r.o. Rybnicna 40 SK-83107 Bratislava	Tel. +421 2 49595201 Fax +421 2 49595200 http://www.sew.sk sew@sew-eurodrive.sk
	Zilina	SEW-Eurodrive SK s.r.o. ul. Vojtecha Spanyola 33 SK-010 01 Zilina	Tel. +421 41 700 2513 Fax +421 41 700 2514 sew@sew-eurodrive.sk
	Banská Bystrica	SEW-Eurodrive SK s.r.o. Rudlovská cesta 85 SK-97411 Banská Bystrica	Tel. +421 48 414 6564 Fax +421 48 414 6566 sew@sew-eurodrive.sk
Slovenia			
Sales Service	Celje	Pakman - Pogonska Tehnika d.o.o. Ul. XIV. divizije 14 SLO - 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net

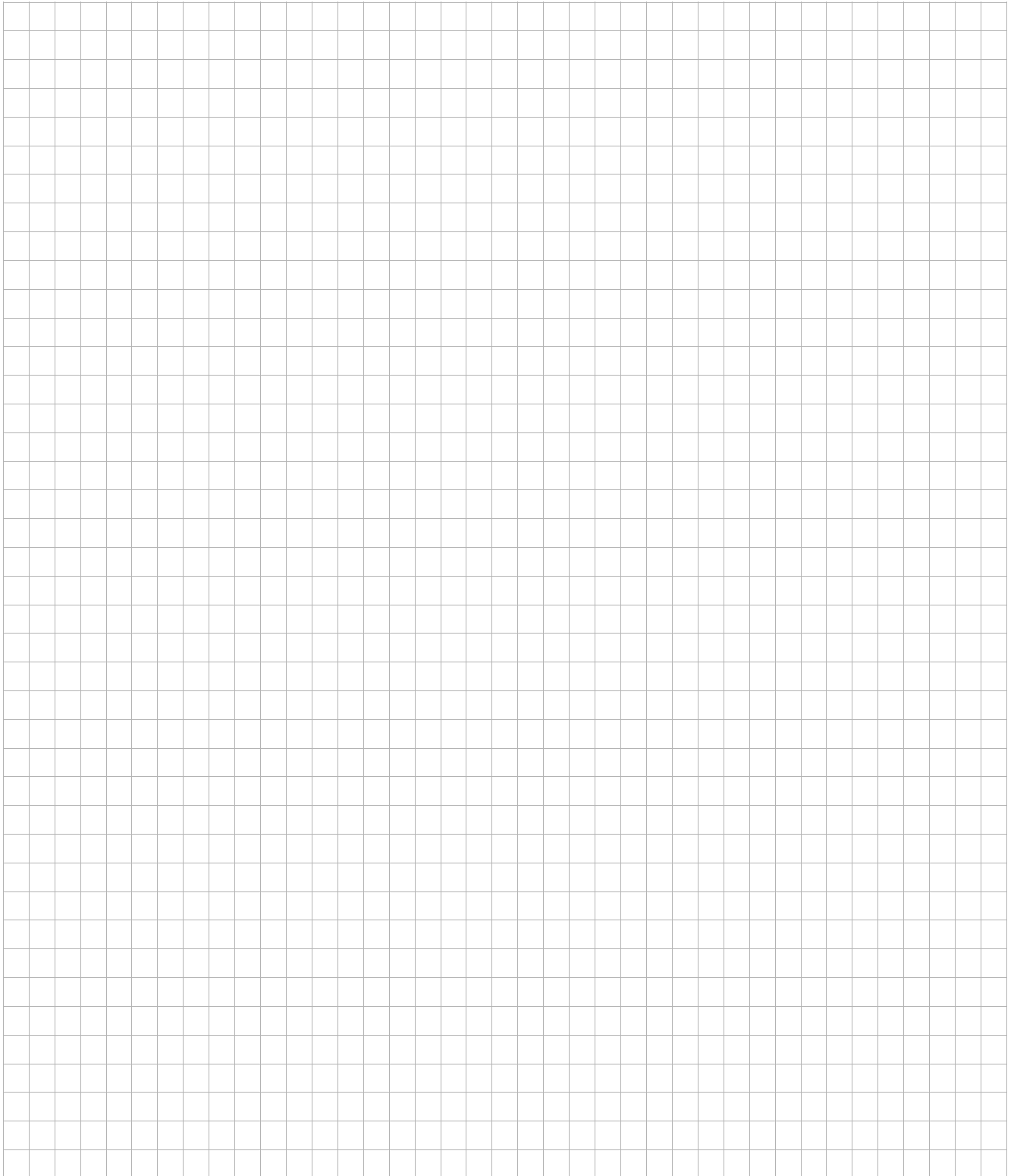


South Africa			
Assembly Sales Service	Johannesburg	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 494-3104 http://www.sew.co.za dross@sew.co.za
	Capetown	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442 Cape Town	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 dswanepoel@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaceo Place Pinetown Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 700-3451 Fax +27 31 700-3847 dtait@sew.co.za
Spain			
Assembly Sales Service	Bilbao	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. +34 9 4431 84-70 Fax +34 9 4431 84-71 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es
Sweden			
Assembly Sales Service	Jönköping	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55303 Jönköping Box 3100 S-55003 Jönköping	Tel. +46 36 3442-00 Fax +46 36 3442-80 http://www.sew-eurodrive.se info@sew-eurodrive.se
Switzerland			
Assembly Sales Service	Basel	Alfred Imhof A.G. Jurastrasse 10 CH-4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch
Thailand			
Assembly Sales Service	Chon Buri	SEW-EURODRIVE (Thailand) Ltd. Bangpakong Industrial Park 2 700/456, Moo.7, Tambol Donhuaroh Muang District Chon Buri 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com
Tunisia			
Sales	Tunis	T. M.S. Technic Marketing Service 7, rue Ibn El Heithem Z.I. SMMT 2014 Mégrine Erriadh	Tel. +216 1 4340-64 + 1 4320-29 Fax +216 1 4329-76 tms@tms.com.tn
Turkey			
Assembly Sales Service	Istanbul	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. Bagdat Cad. Koruma Cikmazi No. 3 TR-34846 Maltepe ISTANBUL	Tel. +90 216 4419163 / 164 3838014/15 Fax +90 216 3055867 sew@sew-eurodrive.com.tr
Ukraine			
Sales Service	Dnepropetrovsk	SEW-EURODRIVE Str. Rabochaja 23-B, Office 409 49008 Dnepropetrovsk	Tel. +380 56 370 3211 Fax +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua



Address List

USA			
Production Assembly Sales Service	Greenville	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Manuf. +1 864 439-9948 Fax Ass. +1 864 439-0566 Telex 805 550 http://www.seweurodrive.com cslyman@seweurodrive.com
Assembly Sales Service	San Francisco	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, California 94544-7101	Tel. +1 510 487-3560 Fax +1 510 487-6381 cshayward@seweurodrive.com
	Philadelphia/PA	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com
	Dayton	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 440-3799 cstroy@seweurodrive.com
	Dallas	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
	Additional addresses for service in the USA provided on request!		
Venezuela			
Assembly Sales Service	Valencia	SEW-EURODRIVE Venezuela S.A. Av. Norte Sur No. 3, Galpon 84-319 Zona Industrial Municipal Norte Valencia, Estado Carabobo	Tel. +58 241 832-9804 Fax +58 241 838-6275 http://www.sew-eurodrive.com.ve sewventas@cantv.net sewfinanzas@cantv.net



How we're driving the world

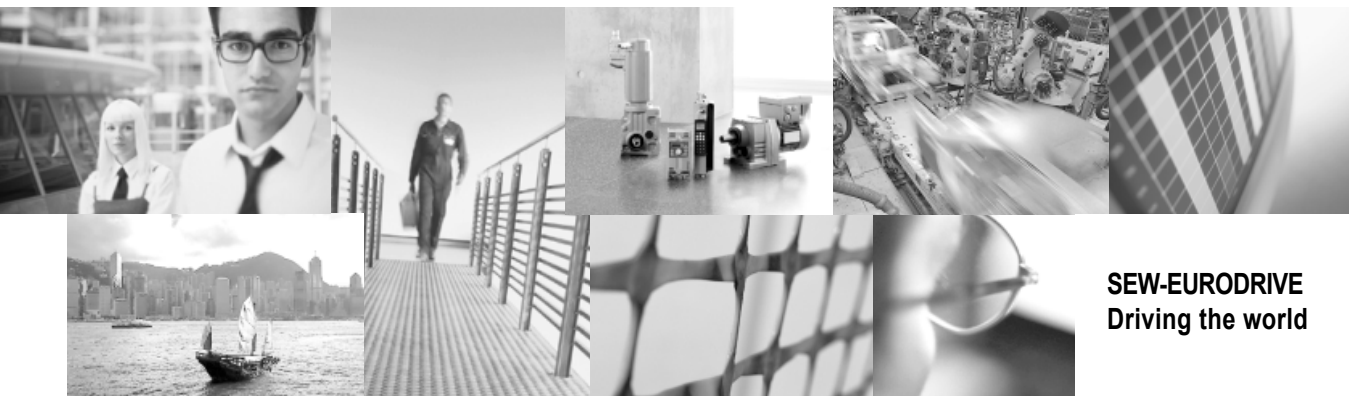
With people who think fast and develop the future with you.

With a worldwide service network that is always close at hand.

With drives and controls that automatically improve your productivity.

With comprehensive knowledge in virtually every branch of industry today.

With uncompromising quality that reduces the cost and complexity of daily operations.



With a global presence that offers responsive and reliable solutions. Anywhere.

With innovative technology that solves tomorrow's problems today.

With online information and software updates, via the Internet, available around the clock.

SEW-EURODRIVE
Driving the world



SEW
EURODRIVE

SEW-EURODRIVE GmbH & Co KG
P.O. Box 3023 · D-76642 Bruchsal / Germany
Phone +49 7251 75-0 · Fax +49 7251 75-1970
sew@sew-eurodrive.com

→ www.sew-eurodrive.com